ifm electronic

Device Manual Supplement

AS-i Gateway AC14
AC1401/02, AC1411/12, AC1421/22

SmartPLC DataLine AC14
AC1403/04, AC1423/24, AC1433/34

SmartPLC SafeLine AC4S
AC402S, AC412S, AC422S, AC432S

**Acyclic command records**

**Command interface**

English

7391129_00_UK 2017 / 09

# Contents

# 1 Preliminary note

**Contents**



14801

## 1.1 Legal and copyright information

1631



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## 1.2 Purpose of the document

23708

This document describes the acyclic data records and the command interface of the following devices:

- AS-i Gateway with Profinet device interface (AC1401/AC1402)
- AS-i Gateway with Profibus slave interface (AC1411/AC1412)
- AS-i Gateway with EtherNet/IP device interace (AC1421/AC1422)
- SmartSPS DataLine with Profinet device interface (AC1403/AC1404)
- SmartSPS DataLine with EtherNet/IP device interace (AC1423/AC1424)
- SmartSPS DataLine with EtherCAT slave interface (AC1433/AC1434)
- SmartSPS SafeLine mit Profinet device interface (AC402S)
- SmartSPS SafeLine mit Profibus slave interface (AC412S)
- SmartSPS SafeLine mit EtherNet/IP device interface (AC422S)
- SmartSPS SafeLine mit EtherCAT slave interface (AC432S)

It is part of the device and contains information about the correct handling of the product.

► Read this document before using the device.

► Keep this document during the service life of the device.

## 1.3 Symbols and styles used

13839

► ... Instructions

> ... Reaction, result

→ ... Cross-reference or internet link

123 Decimal number
0x123 Hexadecimal number
0b010 Binary number

[...] Designation of pushbuttons, buttons or indications

## 1.4 Modification history

21676

| Version | Topic | Date |
|---|---|---|
| 00 | New creation of document | 2017 / 09 |

# 2 Safety instructions

**Contents**



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## 2.1 General

22068

The plant manufacturer is responsible for the safety of the plant in which the device is installed.

If the device is used in a way that is not intended by the manufacturer, the protection supported by the device may be impaired.

Non-observance of the instructions, operation which is not in accordance with use as prescribed below, wrong installation or incorrect handling can affect the safety of operators and machinery.

- ► Observe these operating instructions.
- ► Adhere to the warning notes on the product.

## 2.2 Required background knowledge

22046

This document is intended for specialists. Specialists are people who, based on their relevant training and experience, are capable of identifying risks and avoiding potential hazards that may be caused during operation or maintenance of the product.

The document contains information about the correct handling of the product.

## 2.3 Warnings used

13685

**⚠ WARNING**

Death or serious irreversible injuries may result.

**⚠ CAUTION**

Slight reversible injuries may result.

**NOTICE**

Property damage is to be expected or may result.

Important note
Non-compliance may result in malfunction or interference.

Information
Supplementary note.

# 3 Acyclic data records

**Contents**



17036

The data records are transmitted acyclically upon request of the <fieldbus> master.

## 3.1 Overview: Acyclic data records (DSx)

23386

| Data record | Content | Access r = read w = write | Words |
|---|---|---|---|
| DS1 | System information | r | 26 |
| DS2 | Digital inputs of slaves 1(A)…31(A) and 1B…31B and master flags (Status AS-i master and exec.-ctl. flags and host flags) | r | 36 |
| DS3 | Analogue inputs of slaves 1(A)…15(B) | r | 75 |
| DS4 | Analogue inputs of slaves 16(A)…31(B) | r | 80 |
| DS5 | Digitale outputs of slaves 1(A)…31(A) and 1B...31B | r/w | 32 |
| DS6 | Analogue outputs of slaves 1(A)…15(B) | r/w | 60 |
| DS7 | Analogue otputs of slaves 16(A)…31(B) | r/w | 64 |
| DS8 | Statusflags of analogue output data of slaves 1(A)…31(A) and 1B…31B | r | 32 |
| DS9 | Slave lists LAS, LDS, LPF, LCE | r | 16 |
| DS10 | Slave list LPS | r | 4 |
| DS11 | Actual Configuration data (CDI) | r | 64 |
| DS12 | Projected Configuration data (PCD) | r | 64 |
| DS13 | Image of input parameter | r | 32 |
| DS14 | Image of output parameter | r/w | 32 |
| DS15 | Slave error counter, configuration error counter, AS-i cycle counter | r | 72 |
| DS16 | n.a. | – | – |
| DS17 | AS-i master: Error lists LCEMS, LCEAS, LDAE | r | 12 |
| DS18 | Fieldbus information (only available via CODESYS) | r | 19 |

## 3.2 DS1 – System information

8753

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 0 | Article number [1]) (byte 0) = "A" | | | | | | | | Article number [1]) (byte 1) = “C" | | | | | | | |
| 1 | Article number [1]) (byte 2) = $A_1$ | | | | | | | | Article number [1]) (byte 3) = $A_2$ | | | | | | | |
| 2 | Article number [1]) (byte 4) = $A_3$ | | | | | | | | Article number [1]) (byte 5) = $A_4$ | | | | | | | |
| 3 | Device number [2]) (byte 1) = $G_1$ | | | | | | | | Device number [2]) (byte 0) = $G_2$ | | | | | | | |
| 4 | Serial number [3]) (byte 0, MSB) | | | | | | | | Serial number [3]) (byte 1) | | | | | | | |
| 5 | Serial number [3]) (byte 2) | | | | | | | | Serial number [3]) (byte 3) | | | | | | | |
| 6 | Serial number [3]) (byte 4) | | | | | | | | Serial number [3]) (byte 5) | | | | | | | |
| 7 | Serial number [3]) (byte 6) | | | | | | | | Serial number [3]) (byte 7) | | | | | | | |
| 8 | Serial number [3]) (byte 8) | | | | | | | | Serial number [3]) (byte 9) | | | | | | | |
| 9 | Serial number [3]) (byte 10) | | | | | | | | Serial number [3]) (byte 11) | | | | | | | |
| 10 | Software type | | | | | | | | Software Version (Major Version) | | | | | | | |
| 11 | Software Version (Minor Version) | | | | | | | | Software Version (Build Version) | | | | | | | |
| 12 | Operating hours [5]) Total (byte 3, high byte) | | | | | | | | Operating hours [5]) Total (byte 2) | | | | | | | |
| 13 | Operating hours [5]) Total (byte 1) | | | | | | | | Operating hours [5]) Total (byte 0, low byte) | | | | | | | |
| 14 | Operating hours [5]) Uptime (byte 3, high byte) | | | | | | | | Operating hours [5]) Uptime (byte 2) | | | | | | | |
| 15 | Operating hours [5]) Uptime (byte 1) | | | | | | | | Operating hours [5]) Uptime (byte 0, low byte) | | | | | | | |
| 16 | Operating hours [5]) standard PLC (byte 3, high byte) | | | | | | | | Operating hours [5]) standard PLC (byte 2) | | | | | | | |
| 17 | Operating hours [5]) standard PLC (byte 1) | | | | | | | | Operating hours [5]) standard PLC (byte 0, low byte) | | | | | | | |
| 18 | Operating hours [5]) display (byte 3, high byte) | | | | | | | | Operating hours [5]) display (byte 2) | | | | | | | |
| 19 | Operating hours [5]) display (byte 1) | | | | | | | | Operating hours [5]) display (byte 0, low byte) | | | | | | | |
| 20 | Device temperature [6]) (byte 0, high byte) | | | | | | | | Device temperature [6]) (byte 1, low byte) | | | | | | | |
| 21 | reserved | | | | | | | | Number of AS-i masters | | | | | | | |
| 22 | Language [7]) (1st letter) | | | | | | | | Language [7]) (2nd letter) | | | | | | | |
| 23 | Return to start screen (on/off) | | | | | | | | Screen saver (on/off) | | | | | | | |
| 24 | CODESYS standard PLC operating mode (activ/inactiv) | | | | | | | | Output access | | | | | | | |
| 25 | Device cycle in µs (high byte) | | | | | | | | Device cycle in µs (low byte) | | | | | | | |

[1]) Article number: "AC" + $A_1$ + $A_2$ + $A_3$ + $A_4$ as character string, e.g. "AC14 and AC4S"
[2]) Device number: $G_1$ + $G_2$ as character string, e.g. "AB"
[3]) Serial number: 12-digit character string
[5]) Operating hours: in seconds, Unsigned Double word (32 bit), e.g. 0x000010A709F = 108447 seconds
[6]) Device temperature: in 1/100 °C, signed Word (16 bit), e.g. 4232 = 42.32 °C
[7]) Language: LANG_ID as ASCII code, e.g. "DE" = "D" + "E" = 0x44 + 0x45

[6]) Device temperature: in 1/100 °C, signed Word (16 bit), e.g. 4232 = 42.32 °C
[7]) Language: LANG_ID as ASCII code, e.g. "DE" = "D" + "E" = 0x44 + 0x45

## 3.3 DS2 – Digital inputs of the slaves and master flags

8754

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **0** | reserved | | | | Slave 1(A): D3...D0 | | | | reserved | | | | reserved | | | |
| **1** | reserved | | | | Slave 3(A): D3...D0 | | | | reserved | | | | Slave 2(A): D3...D0 | | | |
| **2** | reserved | | | | Slave 5(A): D3...D0 | | | | reserved | | | | Slave 4(A): D3...D0 | | | |
| **...** | ... | | | | ... | | | | ... | | | | ... | | | |
| **14** | reserved | | | | Slave 29(A): D3...D0 | | | | reserved | | | | Slave 28(A): D3...D0 | | | |
| **15** | reserved | | | | Slave 31(A): D3...D0 | | | | reserved | | | | Slave 30(A): D3...D0 | | | |
| **16** | reserved | | | | Slave 1B: D3...D0 | | | | reserved | | | | reserved | | | |
| **17** | reserved | | | | Slave 3B: D3...D0 | | | | reserved | | | | Slave 2B: D3...D0 | | | |
| **...** | ... | | | | ... | | | | ... | | | | | | | |
| **30** | reserved | | | | Slave 29B: D3...D0 | | | | reserved | | | | Slave 28B: D3...D0 | | | |
| **31** | reserved | | | | Slave 31B: D3...D0 | | | | reserved | | | | Slave 30B: D3...D0 | | | |
| **32** | AS-i master status flags (→ **AS-i master status flags** (→ p. 13)) | | | | | | | | | | | | | | | |
| **33** | Execution control flags (→ **Execution control flags** (→ p. 14)) | | | | | | | | | | | | | | | |
| **34** | Host flags (→ **Host flags** (→ p. 16)) | | | | | | | | | | | | | | | |
| **35** | DAE / EE-Flags (→ **DAE/EE flags** (→ p. 16)) | | | | | | | | | | | | | | | |

## 3.3.1 AS-i master status flags

7160

The AS-i master status flags provide information about the status of the AS-i master. After a status change, the AS-i master immediately updates the flags.

The AS-i master status flags are saved in the following register:

| AS-i master status flags | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **15** | **14** | **13** | **12** | **11** | **10** | **9** | **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** | **0** |
| ECPS | | | | ECP | | | | – | – | WCD | CM | – | HWDT | SER | HER |

Legend:

| Flag | Designation | Description | | Initial value at power-on |
|---|---|---|---|---|
| HER | Hardware Error | 1 (TRUE): | a hardware error occurred during the power-on self test | 0 (FALSE) |
| SER | Software Error | 1 (TRUE): | Software error occurred:<br>Stack Overflow, Stack Underflow, Undefined Opcode, Instruction Fault, Illegal Access, Watchdog Timeout | 0 (FALSE) |
| HWDT | Host Watchdog Timeout | 1 (TRUE): | Host watchdog not triggered by the host within 200 ms; master changed to the offline mode | 0 (FALSE) |
| CM | Configuration Missing | 1 (TRUE): | Configuration not yet fully received from the host. Becomes FALSE as soon as PCD, PP and LPS have been set | 1 (TRUE) |
| WCD | Watchdog Control Disabled | 1 (TRUE): | Signals the host that the watchdog signal is not processed in the master. | 0 (FALSE) |
| ECP | Execution Control Phase | Display of the different phases the execution control goes through during boot (→ table). | | 0 |
| ECPS | Execution Control Phase State | Display of the substates of the different execution control phases (→ table). | | 0 |

| Execution Control Phase | Execution Control Phase State |
|---|---|
| 0 = inactive | – |
| 1 = start phase | 0 = master start and initialisation<br>1 = wait for configuration<br>2 = wait for start |
| 2 = reserved | – |
| 3 = offline phase | – |
| 4 = detection phase | – |
| 5 = activation phase | – |
| 6 = normal operation | 0 = normal data exchange<br>1 = slave finder activated |

## 3.3.2 Execution control flags

7161

The execution control flags provide information about the execution control of the AS-i master. The flags are updated by the AS-i master immediately after each change.

The execution control flags are saved in the following register:

| Execution control flags | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **15** | **14** | **13** | **12** | **11** | **10** | **9** | **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** | **0** |
| – | NOPF | CCOK | PE | – | DEA | AAE | POK | OR | APF | NOA | CA | AA | AN | S0 | COK |

Legend:

| Flag | Designation | Description | | Initial value at power-on |
|---|---|---|---|---|
| COK | Config_OK | 1 (TRUE): | The configuration of all AS-i slaves on the network corresponds to the projection data (CDI=PCD for all activated slaves) && (LDS=LPS=LAS)<br>Exception:<br>Flag APF = 1 and LPS = empty, then COK = 1 | 0 (FALSE) |
| S0 | LDS.0 | 1 (TRUE): | Slave with address 0 found | 0 (FALSE) |
| AN | Auto_Address_Assign | 1 (TRUE): | Auto addressing possible<br>(protected mode = active && auto addressing = active && PCD = CDI && LDS <= LPS) | 0 (FALSE) |
| AA | Auto_Address_Available | 1 (TRUE): | All the necessary conditions for auto addressing are fulfilled. The master waits for slave 0. | 0 (FALSE) |
| CA | Configuration_Active | 0 (FALSE):<br>1 (TRUE): | Master in protected mode<br>Master in projection mode | 0 (FALSE) |
| NOA | Normal_Operation_Active | 1 (TRUE): | Master is in the normal mode<br>(The AS-i master has communicated with at least one slave since the last offline phase. Even if the slave disappears after this, the signal will remain set.) | 0 (FALSE) |
| APF | Asi_Power_Fail | 0 (FALSE):<br>1 (TRUE): | AS-i voltage OK<br>AS-i voltage too low | 1 (TRUE) |
| OR | Offline_Ready | 1 (TRUE): | Master has gone through the offline phase and waits for:<br>APF = 0 and a timeout of 1s | 0 (FALSE) |
| POK | Periphery_OK | 1 (TRUE): | No peripheral faults present, all bits of LPF = 0. | 0 (FALSE) |
| AAE | Auto_Address_Enable | 1 (TRUE): | Auto addressing switched on<br>(Echo of Set_Auto_Address_Enable of host) | 0 (FALSE) |
| DEA | Data_Exchange_Active | 1 (TRUE):<br><br>0 (FALSE): | Data exchange between master and slaves activated (reflects DEA of host flags)<br><br>Instead of the data exchange, ReadID is continually executed on the slaves. | 1 (TRUE) |
| PE | Protocol Error | 1 (TRUE):<br>0 (FALSE): | CTT protocol error<br>No CTT protocol error | 0 (FALSE) |

| Flag | Designation | Description | | Initial value at power-on |
|---|---|---|---|---|
| CCOK | CTT_Config_OK | 1 (TRUE): | The configuration of all CTT slaves on the network corresponds to the projected CCT data.<br>(CCDI = PCCD for all CTT slaves) | 0 (FALSE) |
| NOPF | No_Offline_Phase_Flag | 1 (TRUE): | The master skips the offline phase if one of the following actions is performed:<br>– change to protected mode<br>– change of PCD<br>– change of LPS<br>– change of PCCD | 0 (FALSE) |
| | | 0 (FALSE): | The master goes through the offline phase when changing to the protected mode the next time. | |

### 3.3.3 Host flags

7162

The host flags are regularly updated by the host. The AS-i master cyclically checks the host flags for changes.

The host flags are saved in the following register:

| Host Flags | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **15** | **14** | **13** | **12** | **11** | **10** | **9** | **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** | **0** |
| – | – | – | – | – | – | – | – | – | – | – | – | – | – | DEA | OFF |

Legend:

| Flag | Designation | Description | | Initial value at power-on |
|---|---|---|---|---|
| OFF | Offline | 1 (TRUE): | Execution control of the master changes to the offline mode. The function Set_Offline_Mode() is implemented via this flag. | 0 (FALSE) |
| DEA | Data_Exchange_Active | 1 (TRUE): | Data exchange activated between master and slaves. The function Set_Data_Exchange_Active() is implemented via this flag | 1 (TRUE) |

### 3.3.4 DAE/EE flags

16935

The DAE/EE flags indicate if the double address detection and the earth fault detection are on.

The DEA/EE flags are saved in the following register:

| DAE/EE flags | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **15** | **14** | **13** | **12** | **11** | **10** | **9** | **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** | **0** |
| -- | -- | -- | -- | -- | -- | -- | DAE active | -- | -- | -- | -- | -- | -- | -- | EE active |

Legend:

| Flag | Designation | Description | | Initial value at PowerOn |
|---|---|---|---|---|
| DAE active | Double address detection active | 1 (TRUE):<br>0 (FALSE): | Double address detection is on.<br>Double address detection is off. | 0 (FALSE) |
| EE active | Earth fault detection is active | 1 (TRUE):<br>0 (FALSE): | Earth fault detection is on.<br>Earth fault detection is off. | 1 (TRUE) |

## 3.4 DS3 – Analogue inputs of slaves 1(A)...15(B)

8756

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 0...4 | Analogue input data of single slave 1 or of (slave 1A and slave 1B) | | | | | | | | | | | | | | | |
| 5...9 | Analogue input data of single slave 2 or of (slave 2A and slave 2B) | | | | | | | | | | | | | | | |
| 10...14 | Analogue input data of single slave 3 or of (slave 3A and slave 3B) | | | | | | | | | | | | | | | |
| 15...19 | Analogue input data of single slave 4 or of (slave 4A and slave 4B) | | | | | | | | | | | | | | | |
| 20...24 | Analogue input data of single slave 5 or of (slave 5A and slave 5B) | | | | | | | | | | | | | | | |
| 25...29 | Analogue input data of single slave 6 or of (slave 6A and slave 6B) | | | | | | | | | | | | | | | |
| 30...34 | Analogue input data of single slave 7 or of (slave 7A and slave 7B) | | | | | | | | | | | | | | | |
| 35...39 | Analogue input data of single slave 8 or of (slave 8A and slave 8B) | | | | | | | | | | | | | | | |
| 40...44 | Analogue input data of single slave 9 or of (slave 9A and slave 9B) | | | | | | | | | | | | | | | |
| 45...49 | Analogue input data of single slave 10 or of (slave 10A and slave 10B) | | | | | | | | | | | | | | | |
| 50...54 | Analogue input data of single slave 11 or of (slave 11A and slave 11B) | | | | | | | | | | | | | | | |
| 55...59 | Analogue input data of single slave 12 or of (slave 12A and slave 12B) | | | | | | | | | | | | | | | |
| 60...64 | Analogue input data of single slave 13 or of (slave 13A and slave 13B) | | | | | | | | | | | | | | | |
| 65...69 | Analogue input data of single slave 14 or of (slave 14A and slave 14B) | | | | | | | | | | | | | | | |
| 70...74 | Analogue input data of single slave 15 or of (slave 15A and slave 15B) | | | | | | | | | | | | | | | |

## 3.4.1 Details of the 5-word areas

8758

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **n** | Analogue value channel 0 of single slave x or channel 0 of slave xA | | | | | | | | | | | | | | | |
| **n+1** | Analogue value channel 1 of single slave x or channel 1 of slave xA | | | | | | | | | | | | | | | |
| **n+2** | Analogue value channel 2 of single slave x or channel 0 of slave xB | | | | | | | | | | | | | | | |
| **n+3** | Analogue value channel 3 of single slave x or channel 1 of slave xB | | | | | | | | | | | | | | | |
| **n+4** | TIB | -- | TIA | -- | TOB | -- | TOA | -- | O3 | V3 | O2 | V2 | O1 | V1 | O0 | V0 |

Legend:

| | | | |
|---|---|---|---|
| On | overflow bit | 1 bit | 0 = data is in the valid range<br>1 = data is in the invalid range (especially in case of input modules when the measuring range is not reached or exceeded) |
| TIx | transfer to the slave (transfer Input) | 1 bit | from master profile M4 onwards:<br>0 = slave transmits input data as a value (15 bits long, plus sign)<br>1 = slave transmits input data as a bit pattern (16 bits long, no sign) |
| TOx | transfer from the slave (transfer output) | 1 bit | from master profile M4 onwards:<br>0 = slave receives output data as a value (15 bits long, plus sign)<br>1 = slave receives output data as a bit pattern (16 bits long, no sign) |
| Vn | valid bit | 1 bit | 0 = values in channel n are invalid<br>1 = values in channel n are valid<br>Output data must be valid (Vn = 1) to be enabled in the AS-i slave! |

## 3.5 DS4 – Analogue inputs of slaves 16(A)...31(B)

8759

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **0...4** | Analogue input data of single slave 16 or of (slave 16A and slave 16B) | | | | | | | | | | | | | | | |
| **5...9** | Analogue input data of single slave 17 or of (slave 17A and slave 17B) | | | | | | | | | | | | | | | |
| **10...14** | Analogue input data of single slave 18 or of (slave 18A and slave 18B) | | | | | | | | | | | | | | | |
| **15...19** | Analogue input data of single slave 19 or of (slave 19A and slave 19B) | | | | | | | | | | | | | | | |
| **20...24** | Analogue input data of single slave 20 or of (slave 20A and slave 20B) | | | | | | | | | | | | | | | |
| **25...29** | Analogue input data of single slave 21 or of (slave 21A and slave 21B) | | | | | | | | | | | | | | | |
| **30...34** | Analogue input data of single slave 22 or of (slave 22A and slave 22B) | | | | | | | | | | | | | | | |
| **35...39** | Analogue input data of single slave 23 or of (slave 23A and slave 23B) | | | | | | | | | | | | | | | |
| **40...44** | Analogue input data of single slave 24 or of (slave 24A and slave 24B) | | | | | | | | | | | | | | | |
| **45...49** | Analogue input data of single slave 25 or of (slave 25A and slave 25B) | | | | | | | | | | | | | | | |
| **50...54** | Analogue input data of single slave 26 or of (slave 26A and slave 26B) | | | | | | | | | | | | | | | |
| **55...59** | Analogue input data of single slave 27 or of (slave 27A and slave 27B) | | | | | | | | | | | | | | | |
| **60...64** | Analogue input data of single slave 28 or of (slave 28A and slave 28B) | | | | | | | | | | | | | | | |
| **65...69** | Analogue input data of single slave 29 or of (slave 29A and slave 29B) | | | | | | | | | | | | | | | |
| **70...74** | Analogue input data of single slave 30 or of (slave 30A and slave 30B) | | | | | | | | | | | | | | | |
| **75...79** | Analogue input data of single slave 31 or of (slave 31A and slave 31B) | | | | | | | | | | | | | | | |

## 3.5.1 Details of the 5-word areas

8758

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **n** | Analogue value channel 0 of single slave x or channel 0 of slave xA | | | | | | | | | | | | | | | |
| **n+1** | Analogue value channel 1 of single slave x or channel 1 of slave xA | | | | | | | | | | | | | | | |
| **n+2** | Analogue value channel 2 of single slave x or channel 0 of slave xB | | | | | | | | | | | | | | | |
| **n+3** | Analogue value channel 3 of single slave x or channel 1 of slave xB | | | | | | | | | | | | | | | |
| **n+4** | TIB | -- | TIA | -- | TOB | -- | TOA | -- | O3 | V3 | O2 | V2 | O1 | V1 | O0 | V0 |

Legend:

| | | | |
|---|---|---|---|
| On | overflow bit | 1 bit | 0 = data is in the valid range<br>1 = data is in the invalid range (especially in case of input modules when the measuring range is not reached or exceeded) |
| TIx | transfer to the slave (transfer Input) | 1 bit | from master profile M4 onwards:<br>0 = slave transmits input data as a value (15 bits long, plus sign)<br>1 = slave transmits input data as a bit pattern (16 bits long, no sign) |
| TOx | transfer from the slave (transfer output) | 1 bit | from master profile M4 onwards:<br>0 = slave receives output data as a value (15 bits long, plus sign)<br>1 = slave receives output data as a bit pattern (16 bits long, no sign) |
| Vn | valid bit | 1 bit | 0 = values in channel n are invalid<br>1 = values in channel n are valid<br>Output data must be valid (Vn = 1) to be enabled in the AS-i slave! |

## 3.6 DS5 – Digital outputs of the slaves

8761

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **0** | reserved | | | | slave 1(A): D3...D0 | | | | reserved | | | | reserved | | | |
| **1** | reserved | | | | Slave 3(A): D3...D0 | | | | reserved | | | | Slave 2(A): D3...D0 | | | |
| **2** | reserved | | | | Slave 5(A): D3...D0 | | | | reserved | | | | Slave 4(A): D3...D0 | | | |
| **...** | ... | | | | ... | | | | ... | | | | ... | | | |
| **14** | reserved | | | | Slave 29(A): D3...D0 | | | | reserved | | | | Slave 28(A): D3...D0 | | | |
| **15** | reserved | | | | Slave 31(A): D3...D0 | | | | reserved | | | | Slave 30(A): D3...D0 | | | |
| **16** | reserved | | | | Slave 1B: D3...D0 | | | | reserved | | | | reserved | | | |
| **17** | reserved | | | | Slave 3B: D3...D0 | | | | reserved | | | | Slave 2B: D3...D0 | | | |
| **...** | ... | | | | ... | | | | ... | | | | ... | | | |
| **30** | reserved | | | | Slave 29B: D3...D0 | | | | reserved | | | | Slave 28B: D3...D0 | | | |
| **31** | reserved | | | | Slave 31B: D3...D0 | | | | reserved | | | | Slave 30B: D3...D0 | | | |

## 3.7 DS6 – Analogue outputs of slaves 1(A)...15(B)

8763

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **0...3** | analogue output data of single slave 1 or of (slave 1A and slave 1B) | | | | | | | | | | | | | | | |
| **4...7** | Analogue output data of single slave 2 or of (slave 2A and slave 2B) | | | | | | | | | | | | | | | |
| **8...11** | Analogue output data of single slave 3 or of (slave 3A and slave 3B) | | | | | | | | | | | | | | | |
| **12...15** | Analogue output data of single slave 4 or of (slave 4A and slave 4B) | | | | | | | | | | | | | | | |
| **16...19** | Analogue output data of single slave 5 or of (slave 5A and slave 5B) | | | | | | | | | | | | | | | |
| **20...23** | Analogue output data of single slave 6 or of (slave 6A and slave 6B) | | | | | | | | | | | | | | | |
| **24...27** | Analogue output data of single slave 7 or of (slave 7A and slave 7B) | | | | | | | | | | | | | | | |
| **28...31** | Analogue output data of single slave 8 or of (slave 8A and slave 8B) | | | | | | | | | | | | | | | |
| **32...35** | Analogue output data of single slave 9 or of (slave 9A and slave 9B) | | | | | | | | | | | | | | | |
| **36...39** | Analogue output data of single slave 10 or of (slave 10A and slave 10B) | | | | | | | | | | | | | | | |
| **40...43** | Analogue output data of single slave 11 or of (slave 11A and slave 11B) | | | | | | | | | | | | | | | |
| **44...47** | Analogue output data of single slave 12 or of (slave 12A and slave 12B) | | | | | | | | | | | | | | | |
| **48...51** | Analogue output data of single slave 13 or of (slave 13A and slave 13B) | | | | | | | | | | | | | | | |
| **52...55** | Analogue output data of single slave 14 or of (slave 14A and slave 14B) | | | | | | | | | | | | | | | |
| **56...59** | Analogue output data of single slave 15 or of (slave 15A and slave 15B) | | | | | | | | | | | | | | | |

### 3.7.1 Details 4 channels per analogue slave

8765

The following table shows the structure of the data image to set the parameter:

- `Analogue channels per input slave = 4`
- `Analogue channels per output slave = 4`

| Word Offset-Nr. | Content of the transferred word for parameter setting = `4 channels` |
|---|---|
| n | Mx / slave m(A) / channel |
| n+1 | Mx / slave m(A) / channel |
| n+2 | Mx / slave m(A) / channel 1 = Mx / slave mB / channel 1 |
| n+3 | Mx / slave m(A) / channel 2 = Mx / slave mB / channel 2 |

Legend:

| | |
|---|---|
| n ... | Number of 4 word blocks<br>1 = for setting 4 words<br>...<br>15 = for setting 60 words |
| x ... | 1 = AS-i master 1<br>2 = AS-i master 2 |
| m ... | Numeric part of the selected AS-i slave address |

# 3.8 DS7 – Analogue outputs of slaves 16(A)...31(B)

8766

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **0...3** | analogue output data of single slave 16 or of (slave 16A and slave 16B) | | | | | | | | | | | | | | | |
| **4...7** | Analogue output data of single slave 17 or of (slave 17A and slave 17B) | | | | | | | | | | | | | | | |
| **8...11** | Analogue output data of single slave 18 or of (slave 18A and slave 18B) | | | | | | | | | | | | | | | |
| **12...15** | Analogue output data of single slave 19 or of (slave 19A and slave 19B) | | | | | | | | | | | | | | | |
| **16...19** | Analogue output data of single slave 20 or of (slave 20A and slave 20B) | | | | | | | | | | | | | | | |
| **20...23** | Analogue output data of single slave 21 or of (slave 21A and slave 21B) | | | | | | | | | | | | | | | |
| **24...27** | Analogue output data of single slave 22 or of (slave 22A and slave 22B) | | | | | | | | | | | | | | | |
| **28...31** | Analogue output data of single slave 23 or of (slave 23A and slave 23B) | | | | | | | | | | | | | | | |
| **32...35** | Analogue output data of single slave 24 or of (slave 24A and slave 24B) | | | | | | | | | | | | | | | |
| **36...39** | Analogue output data of single slave 25 or of (slave 25A and slave 25B) | | | | | | | | | | | | | | | |
| **40...43** | Analogue output data of single slave 26 or of (slave 26 and slave 26B) | | | | | | | | | | | | | | | |
| **44...47** | Analogue output data of single slave 27 or of (slave 27 and slave 27B) | | | | | | | | | | | | | | | |
| **48...51** | Analogue output data of single slave 28 or of (slave 28 and slave 28B) | | | | | | | | | | | | | | | |
| **52...55** | Analogue output data of single slave 29 or of (slave 29 and slave 29B) | | | | | | | | | | | | | | | |
| **56...59** | Analogue output data of single slave 30 or of (slave 30 and slave 30B) | | | | | | | | | | | | | | | |
| **60...63** | Analogue output data of single slave 31 or of (slave 31and slave 31B) | | | | | | | | | | | | | | | |

## 3.8.1 Details 4 channels per analogue slave

8765

The following table shows the structure of the data image to set the parameter:

- `Analogue channels per input slave = 4`
- `Analogue channels per output slave = 4`

| Word Offset-Nr. | Content of the transferred word for parameter setting = `4 channels` |
|---|---|
| n | Mx / slave m(A) / channel |
| n+1 | Mx / slave m(A) / channel |
| n+2 | Mx / slave m(A) / channel 1 = Mx / slave mB / channel 1 |
| n+3 | Mx / slave m(A) / channel 2 = Mx / slave mB / channel 2 |

Legend:

| | |
|---|---|
| n ... | Number of 4 word blocks<br>1 = for setting 4 words<br>...<br>15 = for setting 60 words |
| x ... | 1 = AS-i master 1<br>2 = AS-i master 2 |
| m ... | Numeric part of the selected AS-i slave address |

# 3.9 DS8 – Status flags of analogue output data of the slaves 1...31

8768

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **0** | reserved | | | | | | | | | | | | | | | |
| **1** | Status of the analogue output data of single slave 1 or of (slave 1A and slave 1B) | | | | | | | | | | | | | | | |
| **2** | Status of the analogue output data of single slave 2 or of (slave 2A and slave 2B) | | | | | | | | | | | | | | | |
| **...** | ... | | | | | | | | | | | | | | | |
| **30** | Status of the analogue output data of single slave 30 or of (slave 30A and slave 30B) | | | | | | | | | | | | | | | |
| **31** | Status of the analogue output data of single slave 31 or of (slave 31A and slave 31B) | | | | | | | | | | | | | | | |

Details of the words shown above:

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **n** | -- | TOB | -- | TOA | -- | OVB | -- | OVA | reserved | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| OVx | output valid | 1 bit | channel-independent bit "output data valid" from the slave:<br>CTT1:<br>0 = more than 3.5 s have elapsed since the last update of the output values<br>1 = slave requests new output data within the next 3 s<br>CTT2…CTT5:<br>0 = slave receives no new output data<br>1 = slave receives new output data<br>Only valid for analogue **out**put slaves.<br>For **in**put slaves set OVx = "0"! |
| TOx | transfer from the slave (transfer output) | 1 bit | from master profile M4 onwards:<br>0 = slave receives output data as a value (15 bits long, plus sign)<br>1 = slave receives output data as a bit pattern (16 bits long, no sign) |

## 3.10 DS9 – Slave lists LAS, LDS, LPF, LCE

8770

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 0...3 | LAS / list of active slaves | | | | | | | | | | | | | | | |
| 4...7 | LDS / list of detected slaves | | | | | | | | | | | | | | | |
| 8...11 | LPF / list of slaves with periphery faults | | | | | | | | | | | | | | | |
| 12...15 | LCE / list of slaves with configuration errors | | | | | | | | | | | | | | | |

### 3.10.1 Details of the slave lists

8772

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| n | 15(A) | 14(A) | 13(A) | 12(A) | 11(A) | 10(A) | 9(A) | 8(A) | 7(A) | 6(A) | 5(A) | 4(A) | 3(A) | 2(A) | 1(A) | 0 *) |
| n+1 | 31(A) | 30(A) | 29(A) | 28(A) | 27(A) | 26(A) | 25(A) | 24(A) | 23(A) | 22(A) | 21(A) | 20(A) | 19(A) | 18(A) | 17(A) | 16(A) |
| n+2 | 15B | 14B | 13B | 12B | 11B | 10B | 9B | 8B | 7B | 6B | 5B | 4B | 3B | 2B | 1B | res. |
| n+3 | 31B | 30B | 29B | 28B | 27B | 26B | 25B | 24B | 23B | 22B | 21B | 20B | 19B | 18B | 17B | 16B |

*) LAS and LPS have no slave 0, therefore this bit is set to 0!

## 3.11 DS10 – Slave list LPS

8773

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 0...3 | List of projected slaves LPS | | | | | | | | | | | | | | | |

### 3.11.1 Details of the slave lists

8772

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| n | 15(A) | 14(A) | 13(A) | 12(A) | 11(A) | 10(A) | 9(A) | 8(A) | 7(A) | 6(A) | 5(A) | 4(A) | 3(A) | 2(A) | 1(A) | 0 *) |
| n+1 | 31(A) | 30(A) | 29(A) | 28(A) | 27(A) | 26(A) | 25(A) | 24(A) | 23(A) | 22(A) | 21(A) | 20(A) | 19(A) | 18(A) | 17(A) | 16(A) |
| n+2 | 15B | 14B | 13B | 12B | 11B | 10B | 9B | 8B | 7B | 6B | 5B | 4B | 3B | 2B | 1B | res. |
| n+3 | 31B | 30B | 29B | 28B | 27B | 26B | 25B | 24B | 23B | 22B | 21B | 20B | 19B | 18B | 17B | 16B |

*) LAS and LPS have no slave 0, therefore this bit is set to 0!

# 3.12 DS11 – Actual configuration data (CDI)

8775

| Offset Word no. | bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | ID2 code | | | | ID1 code | | | | ID code | | | | IO code | | | |
| 0 | Slave 0 | | | | | | | | | | | | | | | |
| 1 | Slave 1(A) | | | | | | | | | | | | | | | |
| ... | ... | | | | | | | | | | | | | | | |
| 31 | Slave 31(A) | | | | | | | | | | | | | | | |
| 32 | reserved | | | | | | | | | | | | | | | |
| 33 | Slave 1B | | | | | | | | | | | | | | | |
| ... | ... | | | | | | | | | | | | | | | |
| 63 | Slave 31B | | | | | | | | | | | | | | | |

## 3.13 DS12 – Projected configuration data (PCD)

8779

| Offset Word no. | bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | ID2 code | | | | ID1 code | | | | ID code | | | | IO code | | | |
| 0 | reserved | | | | | | | | | | | | | | | |
| 1 | Slave 1(A) | | | | | | | | | | | | | | | |
| 2 | Slave 2(A) | | | | | | | | | | | | | | | |
| ... | ... | | | | | | | | | | | | | | | |
| 31 | Slave 31(A) | | | | | | | | | | | | | | | |
| 32 | reserved | | | | | | | | | | | | | | | |
| 33 | Slave 1B | | | | | | | | | | | | | | | |
| ... | ... | | | | | | | | | | | | | | | |
| 63 | Slave 31B | | | | | | | | | | | | | | | |

## 3.14 DS13 – Image of the input parameters of the slaves (PI)

8781

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **0** | reserved | | | | Slave 1(A): P3...P0 | | | | reserved | | | | reserved | | | |
| **1** | reserved | | | | Slave 3(A): P3...P0 | | | | reserved | | | | Slave 2(A): P3...P0 | | | |
| **2** | reserved | | | | Slave 5(A): P3...P0 | | | | reserved | | | | Slave 4(A): P3...P0 | | | |
| ... | ... | | | | ... | | | | ... | | | | ... | | | |
| **14** | reserved | | | | Slave 29(A): P3...P0 | | | | reserved | | | | Slave 28(A): P3...P0 | | | |
| **15** | reserved | | | | Slave 31(A): P3...P0 | | | | reserved | | | | Slave 30(A): P3...P0 | | | |
| **16** | reserved | | | | Slave 1B: P3...P0 | | | | reserved | | | | reserved | | | |
| **17** | reserved | | | | Slave 3B: P3...P0 | | | | reserved | | | | Slave 2B: P3...P0 | | | |
| ... | ... | | | | ... | | | | ... | | | | ... | | | |
| **30** | reserved | | | | Slave 29B: P3...P0 | | | | reserved | | | | Slave 28B: P3...P0 | | | |
| **31** | reserved | | | | Slave 31B: P3...P0 | | | | reserved | | | | Slave 30B: P3...P0 | | | |

# 3.15 DS14 – Image of the output parameters of the slaves (PP)

8783

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **0** | reserved | | | | Slave 1(A): P3...P0 | | | | reserved | | | | reserved | | | |
| **1** | reserved | | | | Slave 3(A): P3...P0 | | | | reserved | | | | Slave 2(A): P3...P0 | | | |
| **2** | reserved | | | | Slave 5(A): P3...P0 | | | | reserved | | | | Slave 4(A): P3...P0 | | | |
| **...** | ... | | | | ... | | | | ... | | | | ... | | | |
| **14** | reserved | | | | Slave 29(A): P3...P0 | | | | reserved | | | | Slave 28(A): P3...P0 | | | |
| **15** | reserved | | | | Slave 31(A): P3...P0 | | | | reserved | | | | Slave 30(A): P3...P0 | | | |
| **16** | reserved | | | | Slave 1B: P3...P0 | | | | reserved | | | | reserved | | | |
| **17** | reserved | | | | Slave 3B: P3...P0 | | | | reserved | | | | Slave 2B: P3...P0 | | | |
| **...** | ... | | | | ... | | | | ... | | | | ... | | | |
| **30** | reserved | | | | Slave 29B: P3...P0 | | | | reserved | | | | Slave 28B: P3...P0 | | | |
| **31** | reserved | | | | Slave 31B: P3...P0 | | | | reserved | | | | Slave 30B: P3...P0 | | | |

# 3.16 DS15 – Slave error counter, configuration error counter, AS-i cycle counter

8785

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **0** | Error counter in slave 0 | | | | | | | | | | | | | | | |
| **1** | Error counter in slave 1(A) | | | | | | | | | | | | | | | |
| **...** | ... | | | | | | | | | | | | | | | |
| **31** | Error counter in slave 31(A) | | | | | | | | | | | | | | | |
| **32** | reserved | | | | | | | | | | | | | | | |
| **33** | Error counter in slave 1B | | | | | | | | | | | | | | | |
| **...** | ... | | | | | | | | | | | | | | | |
| **63** | Error counter in slave 31B | | | | | | | | | | | | | | | |
| **64** | AS-i cycle counter | | | | | | | | | | | | | | | |
| **65** | Configuration error counter | | | | | | | | | | | | | | | |
| **66** | AS-i error status | | | | | | | | | | | | | | | |
| **67** | Telegram error rate | | | | | | | | | | | | | | | |
| **68** | Message error counter | | | | | | | | | | | | | | | |
| **69** | Voltage error counter 22.5V | | | | | | | | | | | | | | | |
| **70** | Voltage error counter 19V | | | | | | | | | | | | | | | |
| **71** | Earth fault counter | | | | | | | | | | | | | | | |

Legend:

| | |
|---|---|
| AS-i error status ... | **Bit 0:** Configuration error type 1 (missing slave)<br>**Bit 1:** Configuration error type 2 (too many slaves)<br>**Bit 2:** Configuration error type 3 (slave with wrong profile)<br>**Bit 3:** Peripheral fault<br>**Bit 4:** Double address<br>**Bit 8:** internal AS-i master error<br>**Bit 9:** Projection mode<br>**Bit 10:** Slave address 0 detected<br>**Bit 11:** Earth fault<br>**Bit 12:** Voltage drop below 22.5 V<br>**Bit 13:** Voltage drop below 19.0 V<br>**Bit 14:** reserved<br>**Bit 15:** reserved |
| Telegram error rate ... | Number of faulty telegrams during the past 2000 telegram cycles |
| Symmetry ... | AS-i symmetry from -100% to +100%, 0% = symmetrical-to-ground<br>**Bit15:** bit with sign |

# 3.17 DS17 – AS-i master: Error lists LCEMS, LCEAS, LDAE

15911

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 0...3 | LCEMS (list of configuration errors - missing slaves) | | | | | | | | | | | | | | | |
| 4...7 | LCEAS (list of configuration errors - additional slaves) | | | | | | | | | | | | | | | |
| 8...11 | LDAE (list of double address errors) | | | | | | | | | | | | | | | |

## Details of the error lists

6658

The error lists (LCEMS, LCEAS, LDAE) have a size of 64 bits each. The respective bits each represent a slave address:

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| n | 15(A) | 14(A) | 13(A) | 12(A) | 11(A) | 10(A) | 9(A) | 8(A) | 7(A) | 6(A) | 5(A) | 4(A) | 3(A) | 2(A) | 1(A) | 0 |
| n+1 | 31(A) | 30(A) | 29(A) | 28(A) | 27(A) | 26(A) | 25(A) | 24(A) | 23(A) | 22(A) | 21(A) | 20(A) | 19(A) | 18(A) | 17(A) | 16(A) |
| n+2 | 15B | 14B | 13B | 12B | 11B | 10B | 9B | 8B | 7B | 6B | 5B | 4B | 3B | 2B | 1B | - |
| n+3 | 31B | 30B | 29B | 28B | 27B | 26B | 25B | 24B | 23B | 22B | 21B | 20B | 19B | 18B | 17B | 16B |

# 3.18 DS18 – Fieldbus information

17038

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **0** | Fieldbus state | | | | | | | | Fieldbus type | | | | | | | |
| **1** | Ethernet connection status | | | | | | | | Profibus slave address | | | | | | | |
| **2** | Profinet/EtherNet/IP IP address / EtherCAT-Adresse (byte 2) | | | | | | | | Profinet/EtherNet/IP IP address / EtherCAT-Adresse (byte 1, MSB) | | | | | | | |
| **3** | Profinet/EtherNet/IP IP address / EtherCAT-Adresse (byte 4, LSB) | | | | | | | | Profinet/EtherNet/IP IP address / EtherCAT-Adresse (byte 3) | | | | | | | |
| **4** | Profinet/EtherNet/IP subnet mask (byte 2) | | | | | | | | Profinet/EtherNet/IP subnet mask (byte 1, MSB) | | | | | | | |
| **5** | Profinet/EtherNet/IP subnet mask (byte 4, LSB) | | | | | | | | Profinet/EtherNet/IP subnet mask (byte 3) | | | | | | | |
| **6** | Profinet/EtherNet/IP gateway address (byte 2) | | | | | | | | Profinet/EtherNet/IP gateway address (byte 1, MSB) | | | | | | | |
| **7** | Profinet/EtherNet/IP gateway address (byte 4, LSB) | | | | | | | | Profinet/EtherNet/IP gateway address (byte 3) | | | | | | | |
| **8** | MAC0 (byte 2) | | | | | | | | MAC0 (byte 1, LSB) | | | | | | | |
| **9** | MAC0 (byte 4) | | | | | | | | MAC0 (byte 3) | | | | | | | |
| **10** | MAC0 (byte 6, MSB) | | | | | | | | MAC0 (byte 5) | | | | | | | |
| **11** | MAC1 (byte 2) | | | | | | | | MAC1 (byte 1, LSB) | | | | | | | |
| **12** | MAC1 (byte 4) | | | | | | | | MAC1 (byte 3) | | | | | | | |
| **13** | MAC1 (byte 6, MSB) | | | | | | | | MAC1 (byte 5) | | | | | | | |
| **14** | MAC2 (byte 2) | | | | | | | | MAC2 (byte 1, LSB) | | | | | | | |
| **15** | MAC2 (byte 4) | | | | | | | | MAC2 (byte 3) | | | | | | | |
| **16** | MAC2 (byte 6, MSB) | | | | | | | | MAC2 (byte 1, LSB) | | | | | | | |
| **17** | Profinet host address (byte 2) | | | | | | | | Profinet host address (byte 1, MSB) | | | | | | | |
| **18** | Profinet host address (byte 4, LSB) | | | | | | | | Profinet host address (byte 3) | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| Fieldbus type | Name of the fieldbus | 1 byte | 0x00 = no fieldbus present<br>0x01 = Profinet<br>0x02 = Profibus<br>0x03 = EtherNet/IP<br>0x04 = EtherCAT |
| Fieldbus status | Status of the fieldbus connection | 1 byte | 0x00 = initialisation<br>0x01 = waiting for connection<br>0x02 = connection is being established<br>0x03 = configuration of the connection in progress<br>0x04 = parameter setting in progress<br>0x05 = waiting for module configuration<br>0x06 = cyclic data exchange with the fieldbus controller/host<br>0x07 = connection release |
| Profibus slave address | Profibus address of the device | 1 byte | 0x00 = no Profibus<br>0x03 = address 3<br>...<br>0x7B = address 123 |
| Ethernet connection status | Status and Ethernet connections on ports X6 and X7 | 1 byte | 0x00 = no connection or Profibus<br>0x01 = connection on port X7 established, no connection on port X6<br>0x02 = connection on port X6 established, no connection on port X7<br>0x03 = connection on ports X6 and X7 established |

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Profinet/ EtherNet/IP IP address / EtherCAT-Adresse | address of the device | | | | 4 bytes | ▪ for Profinet/EtherNet/IP: IP address<br>One address segment per byte.<br>e.g. `192.168.0.102`<br>Byte 1: 192 = 0xC0<br>Byte 2: 168 = 0xA8<br>Byte 3: 0 = 0x00<br>Byte 4: 102 = 0x66<br>▪ for EtherCAT: EtherCAT address (Configured Station Alias or Second Station Address)<br>e.g. 3577 = 0xDF9<br>Byte 1: 0x0D<br>Byte 2: 0xF9<br>Byte 3: 0x00<br>Byte 4 0x00 | | | | | | | | | | |
| Profinet/ EtherNet/IP-Subnet mask | Subnet mask of the Ethernet network | | | | 4 bytes | One address segment per byte<br>(structre: → Profinet/EtherNet/IP IP address) | | | | | | | | | | |
| Profinet/ EtherNet/IP gateway address | IP address of the EtherNet gateway | | | | 4 bytes | One address segment per byte<br>(structre: → Profinet/EtherNet/IP IP address) | | | | | | | | | | |
| MAC0 | MAC0-ID of the device | | | | 6 bytes | One MAC segment per byte:<br>e.g. `00:02:01:01:98:D2`<br>Byte 1: 0xD2<br>...<br>Byte 6: 0x00<br>▪ Profinet: MAC0 = MAC of the fieldbus interface<br>▪ Profibus/EtherNet/IP/EtherCAT: MAC0 = 00:00:00:00:00:00 | | | | | | | | | | |
| MAC1 | MAC1-ID of the device | | | | 6 Bytes | One MAC segment per byte (structure: → MAC0)<br>▪ Profinet: MAC1 = MAC of the Ethernet port X6<br>▪ EtherNet/IP: MAC1 = MAC2 = MAC of the EtherNet/IP interface<br>▪ Profibus/EtherCAT: MAC1 = 00:00:00:00:00:00 | | | | | | | | | | |
| MAC2 | MAC2-ID of the device | | | | 6 bytes | One MAC segment per byte (structure: → MAC0)<br>▪ Profinet: MAC2 = MAC of the Ethernet port X7<br>▪ EtherNet/IP: MAC2 = MAC1 = MAC of the fieldbus interface<br>▪ Profibus/EtherCAT: MAC2 = 00:00:00:00:00:00 | | | | | | | | | | |
| Profinet host address | IP address of the Profinet host | | | | 4 bytes | One address segment per yte<br>(structure. → Profinet/EtherNet/IP IP address)<br>▪ Profinet: IP address of the Profinet host<br>▪ Profibus/EtherNet/IP/EtherCAT:<br>Byte 1: 0x00<br>Byte 2: 0x00<br>Byte 3: 0x00<br>Byte 4: 0x00 | | | | | | | | | | |

# 4 Command channels

**Contents**



16573

# 4.1 Principle of the command channels

13543

A command channel consists of a request channel and a response channel.

**Command request channel (fieldbus master >>> device)**

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | user ID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3...120 | command parameters | | | | | | | | | | | | | | | |

**Command response channel (device >>> fieldbus master)**

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5...120 | reply data to the command<br>Unused bytes receive invalid values from old command replies. DO NOT evaluate! | | | | | | | | | | | | | | | |

## 4.1.1 Command status

8795

| Status | Status code [hex] | Description |
|---|---|---|
| OK | 00 | Command execution was successful. Response data is available and valid. |
| FAILED | 01 | Error when executing the command. The exact cause of the error occurred is stated in the command-specific error code. The response data is invalid. |
| TO | 02 | Timeout error: The command was cancelled due to timeout. |
| UC | 03 | Unknown Command: The transmitted command number is not known in the system. |
| NOP | 04 | Not valid parameter: The transmitted command parameter is invalid. |

## 4.2 System commands

**Contents**



11077

## 4.2.1 Overview: System commands

8421

| Comm. no. [hex] | Comm. no. [dez] | Description |
|---|---|---|
| 0101 | 257 | Quick Setup AS-i master 1 /2 |
| 0103 | 259 | Select user language |
| 0104 | 260 | Change display settings |
| 0105 | 261 | Set output control |
| 0106 | 262 | Set standard PLC operating mode |
| 0109 | 265 | Set date / time |
| 010A | 266 | Set parameters of the NTP server |
| 010B | 267 | Read date / time / NTP server settings |
| 010C | 268 | Reboot the system |
| 010D | 269 | Read fieldbus information (only available via CODESYS) |
| 010F | 271 | Read text of OSC entry |
| 0110 | 272 | Display target visualization |

## 4.2.2 Command 0x0101 – Quick setup AS-i master 1 + 2

11079

### Command request channel (fieldbus master >>> device)

11080

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | UID | | | | | | | | | | | | | | | |
| **2** | command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | reserved | | | | | | M2 | M1 |
| **4 ...120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| M1 | AS-i master 1 | 1 bit | 0 = "Quick set-up" command is NOT executed on the master<br>1 = "Quick set-up" command is executed on the master |
| M2 | AS-i master 2 | 1 bit | 0 = "Quick set-up" command is NOT executed on the master<br>1 = "Quick set-up" command is executed on the master |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

The command "blocks" further processing as long as the quick set-up needs. That means that the WRREC command signals "busy" until the function result is available. This may take a few seconds.

## Command response channel (device >>> fieldbus master)

11081

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code AS-i master 2<br>**Possible command error codes** (→ p. 41) | | | | | | | | command error code AS-i master 1<br>**Possible command error codes** (→ p. 41) | | | | | | | |

## Possible command error codes

11087

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x03 | SD0 | slave with address 0 connected |
| 0x04 | IM | - no master M1 and/or M2 specified or:<br>- master M2 does not exist (for units with 1 AS-i master) |

When the Quick Setup is not executed for an AS-i master, the return value is always 0x00 (= OK).

The command status has the value `Failed` when one of the errors is present on AS-i master 1 or 2 after command execution.

## 4.2.3 Command 0x0103 – Select user language

11089

Via the command the user lanaguage for the local HMI and the web interface can be set. The language setting always refers to both user interfaces.

### Command request channel (fieldbus master >>> device)

11090

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | LANG_ID | | | | | | | | | | | | | | | |
| 4 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legende:

| | | | |
|---|---|---|---|
| MSG_ID | User language | 1 word | 0x0000 = no language selection, only return active language<br>0x4445 = DE, German<br>0x454E = EN, English (default)<br>0x4652 = FR, French<br>0x4954 = IT, Italian<br>0x4553 = ES, Spanish<br>0x5054 = PT, Portuguese |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

18011

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | current LANG_ID | | | | | | | | | | | | | | | |

## Possible command error codes

11095

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x01 | IL | Language is unknown or not available in this software version |

Error code only appears if command status = FAILED.
The error code `0x01` appears when querying the currently set language (`LANG_ID = 0x0000`). This is to be interpreted as correct processing of the command.

## 4.2.4 Command 0x0104 – Change display settings

11099

### Command request channel (fieldbus master >>> device)

11100

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | reserved | | | | | | RS | DS |
| 4 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| DS | Screen saver | 1 bit | 0 = no screen saver for local display<br>1 = screen saver for local display activated |
| RS | return to splash screen | 1 bit | 0 = when the time has elapsed, device remains on current page<br>1 = when the time has elapsed, devices changes to the splash screen |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

### Command response channel (device >>> fieldbus master)

11086

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

### Possible command error codes

11101

There are no error messages for this command.

## 4.2.5 Command 0x0105 – Set output control

16673

Using this command, the controller instance for the outputs of the AS-i slaves can be set.

### Command request channel (fieldbus master >>> device)

16683

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | OC | | | | | | | |
| 4 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| OC | **O**utput **C**ontrol | 1 byte | 0x01 = GW, gateway<br>0x02 = MAN, manual<br>0x03 = PLC, device-internal PLC |

### Command response channel (device >>> fieldbus master)

16685

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

### Possible command error codes

16687

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x01 | IO | Invalid parameter value transmitted for OC.<br>OR:<br>Control of the outputs could not be set. |

Error code only appears if command status = FAILED.

## 4.2.6 Command 0x0106 – Set standard PLC operating mode

16674

Using this command, the operating mode of the device-internal standard PLC can be set.

### Command request channel (fieldbus master >>> device)

16689

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Reserved | | | | | | | PLC |
| 4 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| PLC | Operating mode of the device-internal PLC | 1 bit | 0x00 = stop PLC application and switch off PLC<br>0x01 = switch on PLC and start PLC application (boot application) |

### Command response channel (device >>> fieldbus master)

16690

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

### Possible command error codes

16691

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x01 | PF | PLC operating mode could not be set. |

Error code only appears if command status = FAILED.

## 4.2.7 Command 0x0109 – Set date/time

16677

Using this command, the system time (date and time) of the device can be set.

### Command request channel (fieldbus master >>> device)

16694

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | month | | | | | | | | Day | | | | | | | |
| 4 | year (byte 2, MSB) | | | | | | | | year (byte 1, LSB) | | | | | | | |
| 5 | minutes | | | | | | | | hours | | | | | | | |
| 6 | reserved | | | | | | | | seconds | | | | | | | |
| 7 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| day | day | 1 byte | 0x01 = 1<br>0x02 = 2<br>...<br>0x1F = 31 |
| month | month | 1 byte | 0x01 = January<br>0x02 = February<br>...<br>0x0C = December |
| Year | Year | 1 word | Possible values: 1971 ... 2037<br>0x07B3 = 1971<br>0x07B4 = 1972<br>...<br>0x07F5 = 2037<br>Example:<br>2014 = 0x07DE<br>year (MSB) = 0x07, year (LSB) = 0xDE |
| hours | hours | 1 byte | 0x00 = 0<br>0x01 = 1<br>...<br>0x17 = 23 |
| minutes | minutes | 1 byte | 0x00 = 0<br>0x01 = 1<br>...<br>0x3B = 59 |
| seconds | seconds | 1 byte | 0x00 = 0<br>0x01 = 1<br>...<br>0x3B = 59 |

## Command response channel (device >>> fieldbus master)

16695

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

## Possible command error codes

16696

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x01 | IDT | Transferred values for date/time are invalid and could not be set. Error |
| 0x02 | NAE | NTP is active, transmitted value for time could not be set.<br>Deactivate NTP to be able to set the time. |

Error code appears if command status = FAILED

## 4.2.8 Command 0x010A – Set parameters of the NTP server

16707

Using this command, the IP parameters of the NTP server can be set.

### Command request channel (fieldbus master >>> device)

16705

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | NTP Offset | | | | | | | | Reserved | | | | | | | NTP |
| 4 | NTP server IP address (high byte, net address) | | | | | | | | NTP server IP address | | | | | | | |
| 5 | NTP server IP address | | | | | | | | NTP server IP address (low byte, host address) | | | | | | | |
| 6 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| NTP | Setting the NTP client | 1 bit | 0x0 = NTP client is inactive<br>0x1 = NTP client is active |
| NTP Offset | NTP server provides the time in UTC. NTP Offset indicates the difference between UTC and local time. | 1 byte | 0x00 = system clock in local time<br>0x01 = UTC -12:00<br>0x02 = UTC -11:00<br>0x03 = UTC -10:00<br>0x04 = UTC -09:00<br>0x05 = UTC -08:00<br>0x06 = UTC -07:00<br>0x07 = UTC -06:00<br>0x08 = UTC -05:00<br>0x09 = UTC -04:00<br>0x0A = UTC -03:30<br>0x0B = UTC -03:00<br>0x0C = UTC -02:00<br>0x0D = UTC -01:00<br>0x0E = UTC +00:00<br>0x0F = UTC +01:00<br>0x10 = UTC +02:00<br>0x11 = UTC +03:00<br>0x12 = UTC +03:30<br>0x13 = UTC +04:00<br>0x14 = UTC +04:30<br>0x15 = UTC +05:00<br>0x16 = UTC +05:30<br>0x17 = UTC +05:45<br>0x18 = UTC +06:00<br>0x19 = UTC +06:30<br>0x1A = UTC +07:00<br>0x1B = UTC +08:00<br>0x1C = UTC +09:00<br>0x1D = UTC +09:30<br>0x1E = UTC +10:00<br>0x1F = UTC +11:00<br>0x20 = UTC +12:00 |

| | | | |
|---|---|---|---|
| NTP server IP address | IP address (IP-V4) of the NTP server | 2 words | Per segment of an IP address: 0 ....255<br>0x00 = 000<br>0x01 = 001<br>...<br>0x0FF = 255<br>Example:<br>IP address: 192.168.150.5<br>192 = 0xC0 (high byte)<br>168 = 0xA8<br>150 = 0x96<br>005 = 0x05 (low byte) |

The duration of the synchronisation process depends on the settings of the NTP server. This means that the synchronised system time is not immediately available after activation of the NTP client.

► Do not query the synchronised system time immediately after activation of the NTP client.

## Command response channel (device >>> fieldbus master)

16706

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

## Possible command error codes

16707

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x01 | IS | Wrong parameters transmitted. NTP server settings were not transmitted. |

Error code appears if command status = FAILED

## 4.2.9 Command 0x010B – Read date / time / NTP settings

16679

Using this command, the current values for time, date and NTP settings can be read.

### Command request channel (fieldbus master >>> device)

16712

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

### Command response channel (device >>> fieldbus master)

16713

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | month | | | | | | | | day | | | | | | | |
| 6 | year (byte 2, MSB) | | | | | | | | year (byte 1, LSB) | | | | | | | |
| 7 | minutes | | | | | | | | hours | | | | | | | |
| 8 | reserved | | | | | | | | seconds | | | | | | | |
| 9 | NTP Offset | | | | | | | | reserved | | | | | | | NTP |
| 10 | NTP server IP address (high byte, net address) | | | | | | | | NTP server IP address | | | | | | | |
| 11 | NTP server IP address | | | | | | | | NTP server IP address (low byte, host address) | | | | | | | |

Legend:

| | |
|---|---|
| - day<br>- month<br>- year<br>- hours<br>- minutes<br>- seconds | → Command 0x010A – Set parameters of the NTP server (→ p. 49) |
| - NTP<br>- NTP Offset<br>- NTP server IP address | → Command 0x010A – Set parameters of the NTP server (→ p. 49) |

### Possible command error codes

16714

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |

## 4.2.10 Command 0x010C – Reboot system

16680

Using the command, the device can be restarted.

### Command request channel (fieldbus master >>> device)

7032

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | 0x4F (= O) | | | | | | | | 0x42 (= B) | | | | | | | |
| 4 | 0x54 (= T) | | | | | | | | 0x4F (= O) | | | | | | | |
| 5 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

To prevent an unintended or unauthorised restart of the system by calling the command `0x010C`, a signature must be transmitted in addition. The command execution is stopped when a wrong signature is transmitted.

The signature is: BOOT

### Command response channel (device >>> fieldbus master)

7044

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

### Possible command error codes

7050

| Error Code | Error | Description |
|---|---|---|
| 0x01 | | Command error: Reboot could not be carried out. |

Error code only appears if command status = FAILED.

## 4.2.11 Command 0x010D – Read fieldbus info

7052

The command reads information via the fieldbus.

The command can only be executed using the function block ACnnnn_SysCmd under CODESYS! (→ programming manual, section **ACnnnn_SysCmd**)

### Command request channel (fieldbus master >>> device)

7064

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

### Command response channel (device >>> fieldbus master)

8909

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 ... 23 | → **DS18 – Fieldbus information** (→ p. 33) | | | | | | | | | | | | | | | |
| 24 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

### Possible command error codes

7030

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |

## 4.2.12 Command 0x010F – Read message text of an OSC entry

12126

The command reads the message text of the current OSC entry and return it.

The command can only be executed by using the function block `ACnnnn_SysCmd` in CODESYS development system (→ Programming manual, section **ACnnnnSysCmd**).

### Command request channel (fieldbus master >>> device)

7171

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | Record Handle (Low Word) | | | | | | | | | | | | | | | |
| 4 | Record Handle (High Word) | | | | | | | | | | | | | | | |
| 5 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| Record Handle | Address of the OSC entry | 2 words | ▪ Low Word:<br>0x000 = current OSC entry<br>▪ High Word:<br>0x0000 = current OSC entry |

## Command response channel (device >>> fieldbus master)

7158

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | reflected user ID | | | | | | | | | | | | | | | |
| **2** | reflected command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| **4** | command error code | | | | | | | | | | | | | | | |
| **5 ... n** | Record Message Text (UTF8, zero terminated) | | | | | | | | | | | | | | | |
| **(n+1) ... 120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend

| | | | |
|---|---|---|---|
| Record Message Text | Message text of the OSC entry | n words | ▪ Message text is UTF-8 coded<br>Indication of the end of the text: zero terminated (= 0x00) |

## Possible command error codes

7172

| Error Code | Error | Description |
|---|---|---|
| 0x01 | | Internal database error |
| 0x02 | | No entry found. OSC database empty or entry with the indicated Record Handle does not exist. |

Error code only appears, if the command status = FAILED.

## 4.2.13 Command 0x0110 – Display target visualisation

20593

This command enables switching between the menu page of the GUI and the target visualisation as well as enables/disables the use of the key combination [◀] + [▶].

### Command request channel (fieldbus master >>> device)

20594

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | TargetVisu | | | | | | | | | | | | | | | |
| 4 | Hotkey | | | | | | | | | | | | | | | |
| 5...120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| TargetVisu | Content of the device display | 1 Word | 0x0000 = display GUI<br>0x0001 = display target visualisation |
| Hotkey | Key combination for switching from target visualisation to the menu page of the GUI | 1 Word | 0x0000 = key combination enabled<br>0x0001 = key combination disabled |

### Command reply channel (device >>> fieldbus master)

20595

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

### Possible command error codes

20596

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x01 | | Target visualisation cannot be displayed because CODESYS PLC is not active |

Error code appears if command status = FAILED

# 4.3 AS-i master commands

**Contents**



8797

## 4.3.1 Overview: AS-i master commands

7250

| Command [hex] | Command [dec] | Description | Note |
|---|---|---|---|
| 0001 | 1 | write parameters to a connected AS-i slave | |
| 0003 | 3 | adopt and save currently connected AS-i slaves in the configuration<br>This command causes a reset of the fieldbus connection. The device must be rebooted! | ConfDataInput Slave → Projected Configuration Data and LDS → LPS |
| 0004 | 4 | Change the list of the projected AS-i slaves (LPS) | |
| 0005 | 5 | set the operating mode of the AS-i master | |
| 0006 | 6 | readdress a connected AS-i slave | |
| 0007 | 7 | set the auto addressing mode of the AS-i master | |
| 0009 | 9 | change the extended ID code 1 in the connected AS-i slave | |
| 000A | 10 | change PCD | |
| 000D | 13 | AS-i master supply voltage, symmetry, earth fault | |
| 0015 | 21 | read ID string of an AS-i slave with profile S-7.4 | Slave profile S-7.4 |
| 0019 | 25 | Set test mode | |
| 001A | 26 | read AS-i master info | |
| 001C | 28 | Deactivation of the slave reset when changing to the protected mode | |
| 0021 | 33 | read diagnosis string of an AS-i slave with profile S-7.4 | Slave profile S-7.4 |
| 0022 | 34 | read parameter string of an AS-i slave with profile S-7.4 | Slave profile S-7.4 |
| 0023 | 35 | write parameter string of an AS-i slave with profile S-7.4 | Slave profile S-7.4 |
| 0024 | 36 | CTT2 standard read:<br>Acyclic standard read call of an AS-i slave with CTT2 profile | CTT2 slave profile *) |
| 0025 | 37 | CTT2 standard write:<br>Acyclic standard write call of an AS-i slave with CTT2 profile | CTT2 slave profile *) |
| 0026 | 38 | CTT2 vendor specific read:<br>acyclic manufacturer-specific read call of an AS-i slave with CTT2 profile | CTT2 slave profile *) |
| 0027 | 39 | CTT2 vendor specific write:<br>acyclic manufacturer-specific write call of an AS-i slave with CTT2 profile | CTT2 slave profile *) |
| 0040 | 64 | CTT2 device group read:<br>Acyclic devicegroup read call of an AS-i slave with CTT2 profile | CTT2 slave profile *) |
| 0041 | 65 | CTT2 device group write:<br>Acyclic devicegroup write call of an AS-i slave with CTT2 profile | CTT2 slave profile *) |
| 0042 | 66 | CTT2 vendor specific selective read from buffer:<br>Selective standard read call of an AS-i slave with CTT2 profile | CTT2 slave profile *) |
| 0043 | 67 | CTT2 vendor specific selective write from buffer:<br>Selective standard write call of an AS-i slave with CTT2 profile | CTT2 slave profile *) |
| 0044 | 68 | CTT2 vendor specific selective read:<br>Selective manufacturer-specific read call of an AS-i slave with CTT2 profile | CTT2 slave profile *) |
| 0045 | 69 | CTT2 vendor specific selective write:<br>Selective manufacturer-specific write call of an AS-i slave with CTT2 profile | CTT2 slave profile *) |

| Command [hex] | Command [dec] | Description | Note |
|---|---|---|---|
| 0046 | 70 | CTT2 device group selective read:<br>Selective devicegroup read call of an AS-i slave with CTT2 profile | CTT2 slave profile *) |
| 0047 | 71 | CTT2 device group selective write:<br>Selective devicegroup write call of an AS-i slave with CTT2 profile | CTT2 slave profile *) |
| 0049 | 73 | CTT2 vendor specific exchange:<br>Manufacturer-specific data exchange with an AS-i slave with CTTS profile | CTT2 slave profile *) |
| 004A | 74 | CTT2 device group exchange:<br>Devicegroup data exchange with an AS-i slave with CTTS profile | CTT2 slave profile *) |
| 004B | 75 | CTT2 device group selective read from buffer:<br>Manufacturer-specific write/read call of an AS-i slave with CTTS profile | CTT2 slave profile *) |
| 004C | 76 | CTT2 device group selective write from buffer:<br>Devicegroup write/read call of an AS-i slave with CTTS profile | CTT2 slave profile *) |
| 0050 | 80 | Set AS-i master parameters | |
| 0051 | 81 | Reset error counter | |

Legend:

CTT → chapter **Combined transaction – Use of analogue channels in the gateway depending on the slave profile**

*) CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

## 4.3.2 Error codes of the AS-i master commands

Contents



8836

## General error codes

5682

Revision: 2014-03-05

| Error Code | Error | Description |
|---|---|---|
| 0x01 | NOK | no slave response OR:<br>master is in the offline mode when requesting the command |
| 0x02 | SND | no slave with the old address found |
| 0x03 | SD0 | slave with address 0 connected |
| 0x04 | SD2 | slave with the new address already exists |
| 0x05 | DE | error when deleting the old address |
| | 0x06 | error when reading the IO configuration |
| 0x07 | SE | error when writing the new address or extended ID code 1 |
| 0x08 | AT | new address could only be saved temporarily |
| 0x09 | ET | extended ID code 1 could only be saved temporarily |
| 0x0A | NA | the slave is not in the LAS |
| 0x0B | ID | parameter or address invalid |
| | 0x0C | faulty S-7.4 protocol sequence |
| 0x0D | ST | S-7.4 protocol aborted (timeout) |
| 0x0E | IA | invalid AS-i slave address for the S-7.4 protocol (e.g. B slaves) |
| 0x0F | SSA | AS-i slave has aborted the S-7.4 string |
| | 0x10 | AS-i S-7.4 no longer connected (no longer in LAS) |
| 0x11 | STA | another S-7.4 transfer to the addressed AS-i slave is already active |
| 0x12 | HSE | the previous segmented S-7.4 transfer was not yet completed |
| 0x13 | IDL | invalid S-7.4 data length |
| | 0x14 | master is in the wrong operating mode *) |
| | 0x16 | timeout during command processing |
| 0x17 | CMD_PRE | start requirements for S-7.4 command not met:<br>- wrong slave profile (is not S-7.4) or:<br>- slave is not in LAS or:<br>- master is not in the Protected mode |
| 0x18 | NM | master is not in the protected mode |
| 0x19 | | master is not in projection mode |
| | 0x20 | command could not be processed within the specified time |
| | 0xE0...0xEF | CTT2 error detected by AS-i slave; → **Standard CTT2 error codes** (→ p. 62) |
| | 0xF0 | invalid CTT2 command |
| | 0xF1 | invalid CTT2 response |
| | 0xF2 | S-7.5 data length longer than 30 bytes |

## Standard CTT2 error codes

8931

The "standard CTT2 error code" provides information about errors occurred during processing of a CTT2 command. It is transmitted in data byte 0 of the response channel of a CTT2 command. The following table shows the possible values:

| Error code | Description |
|---|---|
| 0x00 | No fault |
| 0x01 | Invalid index |
| 0x02 | Invalid length |
| 0x03 | Command not implemented |
| 0x04 | Used, the command could not be completed in the specified time |
| 0x05 | Command was not acknowledged |
| 0x06 | Invalid sub-index |
| 0x07 | Command 'Selective Read Request' is missing |

## CTT2 error object

18393

In addition to the standard CTT2 error code, the "CTT2 error object" provides further manufacturer-specific information about errors which occurred during processing of a CTT2 command. It is transmitted in the response channel of a CTT2 command in the data bytes 0...5. The CTT2 error object has the following structure:

| Data byte | Content |
|---|---|
| 0 | standard CTT2 error code<br>(→ **Standard CTT2 error codes** (→ p. 62)) |
| 1...4 | manufacturer-specific error information<br>(→ data sheet of the AS-i slave) |

### 4.3.3 Command 0x0001 – Change parameters of an AS-i slave

8799

**Requirement:** The addressed AS-i master must be in the protected mode.
→ **Command 0x0005 – Change the operating mode of the AS-i master** (→ p. 67)

#### Command request channel (fieldbus master >>> device)

11103

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| 4 | reserved | | | | | | | | reserved | | | | New output parameter | | | |
| 5...120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

If the requested slave address (SLA) is not in the list of activated slaves (LAS), the new parameters are stored in the AS-i master despite error message (error code 0x0A). If an AS-i slave with this address is added to the AS-i network at a later point, the slave automatically adopts the saved parameters.

## Command response channel (device >>> fieldbus master)

11104

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | reserved | | | | | | | | reserved | | | | Input parameters | | | |
| 6 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

## Possible command error codes

11105

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x01 | NOK | no slave response OR:<br>master is in the offline mode when requesting the command |
| 0x0A | NA | the slave is not in the LAS |
| 0x0B | ID | parameter or address invalid |
| 0x0E | IA | invalid AS-i slave address for the S-7.4 protocol (e.g. B slaves) |
| 0x18 | NM | master is not in the protected mode |

### 4.3.4 Command 0x0003 – Project the currrent AS-i network

8805

(= project all)

**Requirement:** The addressed AS-i master must be in the projection mode.
→ **Command 0x0005 – Change the operating mode of the AS-i master** (→ p. 67)

This command causes a reset of the fieldbus connection. The device must be rebooted!

#### Command request channel (fieldbus master >>> device)

11107

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legende:

| | | | |
|---|---|---|---|
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

#### Command response channel (device >>> fieldbus master)

11086

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

#### Possible command error codes

11109

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x03 | SD0 | slave with address 0 connected |
| 0x19 | | master is not in projection mode |

## 4.3.5 Command 0x0004 – Change LPS

8806

**Requirement:** The addressed AS-i master must be in the projection mode.
→ **Command 0x0005 – Change the operating mode of the AS-i master** (→ p. 67)

### Command request channel (fieldbus master >>> device)

11111

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | 15(A) | 14(A) | 13(A) | 12(A) | 11(A) | 10(A) | 9(A) | 8(A) | 7(A) | 6(A) | 5(A) | 4(A) | 3(A) | 2(A) | 1(A) | -- |
| 4 | 31(A) | 30(A) | 29(A) | 28(A) | 27(A) | 26(A) | 25(A) | 24(A) | 23(A) | 22(A) | 21(A) | 20(A) | 19(A) | 18(A) | 17(A) | 16(A) |
| 5 | 15B | 14B | 13B | 12B | 11B | 10B | 9B | 8B | 7B | 6B | 5B | 4B | 3B | 2B | 1B | -- |
| 6 | 31B | 30B | 29B | 28B | 27B | 26B | 25B | 24B | 23B | 22B | 21B | 20B | 19B | 18B | 17B | 16B |
| 7...120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

### Command response channel (device >>> fieldbus master)

11086

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

### Possible command error codes

11112

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x19 | | master is not in projection mode |

## 4.3.6 Command 0x0005 – Change the operating mode of the AS-i master

8807

### Command request channel (fieldbus master >>> device)

11114

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | MOD | | | | | | | |
| 4 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| MOD | operating mode | 1 byte | 0x00 = set master to the normal mode (protected mode)<br>0x01 = set master to the projection mode |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

### Command response channel (device >>> fieldbus master)

11086

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

### Possible command error codes

11115

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x03 | SD0 | slave with address 0 connected |

## 4.3.7 Command 0x0006 – Change AS-i slave address

8808

**Requirement:** The addressed AS-i master must be in the projection mode.
→ **Command 0x0005 – Change the operating mode of the AS-i master** (→ p. 67)

### Command request channel (fieldbus master >>> device)

11117

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | reserved | | ST | old SLA | | | | |
| 4 | reserved | | | | | | | | reserved | | ST | new SLA | | | | |
| 5...120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

11086

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

## Possible command error codes

11118

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x01 | NOK | no slave response OR:<br>master is in the offline mode when requesting the command |
| 0x02 | SND | no slave with the old address found |
| 0x03 | SD0 | slave with address 0 connected |
| 0x04 | SD2 | slave with the new address already exists |
| 0x05 | DE | error when deleting the old address |
| 0x06 | | error when reading the extended ID code 1 |
| 0x07 | SE | error when writing the new address or extended ID code 1 |
| 0x08 | AT | new address could only be saved temporarily |
| 0x09 | ET | extended ID code 1 could only be saved temporarily |
| 0x18 | NM | master is not in the protected mode |

## 4.3.8 Command 0x0007 – Set the auto address mode of the AS-i master

8811

### Command request channel (fieldbus master >>> device)

11120

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | AutoAd | | | | | | | |
| 4 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| AutoAd | automatic addressing | 1 byte | 00 = deactivate automatic addressing<br>01 = activate automatic addressing |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

### Command response channel (device >>> fieldbus master)

11086

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

### Possible command error codes

11101

There are no error messages for this command.

## 4.3.9 Command 0x0009 – Change extended ID1 in the AS-i slave

8812

### Command request channel (fieldbus master >>> device)

11121

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| 4 | reserved | | | | | | | | new Extended ID-Code 1 | | | | | | | |
| 5 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

11086

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

## Possible command error codes

11121

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x02 | SND | no slave with the old address found |
| 0x03 | SD0 | slave with address 0 connected |
| 0x05 | DE | error when deleting the old address |
| 0x06 | | error when reading the extended ID code 1 |
| 0x07 | SE | error when writing the new address or extended ID code 1 |
| 0x09 | ET | extended ID code 1 could only be saved temporarily |
| 0x0E | IA | invalid AS-i slave address 0 or 0B, or address 0 indicated twice |
| 0x18 | NM | master is not in the protected mode |
| 0x21 | | invalid ID code 1 (if bit 3 is set for A/B slave) |

## 4.3.10 Command 0x000A – Change PCD

8814

### Command request channel (fieldbus master >>> device)

11125

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | ID2-Code | | | | ID1-Code | | | | ID-Code | | | | IO-Code | | | |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | | | | | | | | |
| 4…34 | Slave 1(A)…Slave 31(A) | | | | | | | | | | | | | | | |
| 35 | reserved | | | | | | | | | | | | | | | |
| 36…66 | Slave 1B…Slave 31B | | | | | | | | | | | | | | | |
| 67...120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

### Command response channel (device >>> fieldbus master)

11086

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

### Possible command error codes

11112

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x19 | | master is not in projection mode |

## 4.3.11 Command 0x000D – AS-i master supply voltage, symmetry, earth fault

8815

### Command request channel (fieldbus master >>> device)

11107

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legende:

| | | | |
|---|---|---|---|
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

11128

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | reserved | | | | | | | | reserved | | PF1 | PF2 | SE | EF | PM | PS |
| 6 | Voltage ASi+ to ASi- in [mV] | | | | | | | | | | | | | | | |
| 7 | Voltage FE to ASi- in [mV] | | | | | | | | | | | | | | | |
| 8 | Symmetry (-100...100) in [%] | | | | | | | | | | | | | | | |
| 9 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| EF | earth fault | 1 bit | 0 = no earth fault is detected<br>1 = asymmetric supply voltage; classified as earth fault |
| PF1 | **p**ower**f**ail 22.5 V | 1 bit | 0 = no AS-i Power Fail (classic APF)<br>1 = AS-i voltage < 22.5 V<br>There is an AS-i power fail (classic APF) |
| PF2 | **p**ower**f**ail 19 V | 1 bit | 0 = no AS-i Power Fail (24V APF)<br>1 = AS-i voltage < 19 V<br>There is an AS-i power fail (24V APF) |
| PM | **p**ower**m**odule | 1 bit | 0 = no data decoupling module is connected<br>1 = a data decoupling module is connected |
| PS | **p**ower**s**ource | 1 bit | 0 = the device is supplied from AUX<br>1 = the device is supplied from AS-i |
| SE | **s**tatus **e**arth fault detection | 1 bit | 0 = no earth fault detection possible (e.g. no AS-i voltage)<br>1 = earth fault detection provides valid data |

### Possible command error codes

11101

There are no error messages for this command.

## 4.3.12 Command 0x0015 – Read ID string of an AS-i profile (S-7.4)

8822

### Command request channel (fieldbus master >>> device)

11130

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| 4 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legende:

| | | | |
|---|---|---|---|
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

11131

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | Number of bytes received as from word no. 4 | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | I/O | 2D | DT Start | | | DT Count | | | Mux field | | | E type | | | | |
| 7 | number of parameter bytes to be read | | | | | | | | EDT Read | | | reserved | | Diag | reserved | |
| 8 | EDT Write | | | reserved | | | | | Number of parameter bytes to be written | | | | | | | |
| 9 | Device-specific information | | | | | | | | Manufacturer identification | | | | | | | |
| 10...m | Device-specific information | | | | | | | | Device-specific information | | | | | | | |
| (m+1)...120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| 2D | double data transfer | 1 bit | double data transfer (redundancy) possible<br>0 = simple data transfer<br>1 = double data transfer |
| | number of parameter bytes to be read | 1 byte | number of bytes which can be read as parameter string<br>00 = no parameter string readable<br>01...$DB_{hex}$ = 01...$219_{dec}$ = number of bytes |
| | number of parameter bytes to be written | 1 byte | number of bytes which can be written as parameter string<br>00 = no parameter string readable<br>01...$DB_{hex}$ = 01...$219_{dec}$ = number of bytes |
| Diag | slave supports the 7.4 diagnosis string | 1 bit | 0 = diagnosis string is not supported<br>1 = diagnosis string is supported |
| DT-Count | number of data triples | 3 bits | (information for the driver in the master) |
| DT-Start | start triple | 3 bits | (information for the driver in the master) |
| E type | slave function + data structure | 5 bits | characterises the slave as regards functionality and data structure<br>00 = reserved<br>01 = transmitted values are measured values<br>02 = transmitted values are 16 digital bit values<br>03 = normal operation in 4-bit mode (4I/4O)<br>04...$1F_{hex}$ = 04...$31_{dec}$ = reserved |
| EDT read | reserved | 3 bits | reserved for later profiles |
| EDT write | reserved | 3 bits | reserved for later profiles |
| | device-specific information | 1 byte | as an option more bytes for the manufacturer-specific device description |
| | manufacturer identification | 1 byte | defined manufacturer number assigned by AS-International |
| I/O | direction of data | 1 bit | direction of data for the devices with E type ≠ 3<br>0 = input<br>1 = output |
| Mux field | number of multiplexed data words | 3 bits | 0…3<br>number = value in "Mux field" +1 |

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |

## Possible command error codes

11132

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x01 | NOK | no slave response OR:<br>master is in the offline mode when requesting the command |
| 0x0D | ST | S-7.4 protocol aborted (timeout) |
| 0x0E | IA | invalid AS-i slave address for the S-7.4 protocol (e.g. B slaves) |
| 0x10 | | AS-i S-7.4 slave deleted from LAS during current transmission |
| 0x11 | STA | another S-7.4 transfer to the addressed AS-i slave is already active |
| 0x17 | CMD_PRE | start requirements for S-7.4 command not met:<br>- wrong slave profile (is not S-7.4) or:<br>- slave is not in LAS or:<br>- master is not in the Protected mode |

## 4.3.13 Command 0x001A – Read AS-i master info

8827

### Command request channel (fieldbus master >>> device)

11107

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legende:

| | | | |
|---|---|---|---|
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

### Command response channel (device >>> fieldbus master)

11137

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | M12 | | | | | | | | reserved | | | | | | | |
| 6 | Master firmware version, places before the decimal point | | | | | | | | | | | | | | | |
| 7 | Master firmware version, decimal places | | | | | | | | | | | | | | | |
| 8 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| M12 | number of AS-i masters | 1 byte | 0x00 = device has 1 AS-i master<br>0x01 = device has 2 AS-i masters |

### Possible command error codes

11101

There are no error messages for this command.

## 4.3.14 Command 0x001C – Deactivate slave reset when changing to the protected mode

8828

When changing from the projection mode to the protected mode, all slaves are normally briefly reset (reset or offline phase). This may lead to problems when the system is running. In such cases the "deactivation of the slave reset" prevents the short deactivation of the slave outputs during changing of the operating mode.

### Command request channel (fieldbus master >>> device)

11139

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | OLP | | | | | | | |
| 4 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| OLP | offline phase<br>= slave reset | 1 byte | 0x00 = offline phase when changing over to the protected mode<br>0x01 = no offline phase when changing over to the protected mode |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

### Command response channel (device >>> fieldbus master)

11086

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

### Possible command error codes

11101

There are no error messages for this command.

## 4.3.15 Command 0x0021 – Read diagnosis string of an AS-i slave (S-7.4)

8829

### Command request channel (fieldbus master >>> device)

11130

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| 4 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legende:

| | | | |
|---|---|---|---|
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

11141

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | reflected user ID | | | | | | | | | | | | | | | |
| **2** | reflected command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| **4** | command error code | | | | | | | | | | | | | | | |
| **5** | Number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| **6...m** | Diagnosis byte n+1 | | | | | | | | Diagnosis byte n | | | | | | | |
| **(m+1)...120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |

## Possible command error codes

11132

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x01 | NOK | no slave response OR:<br>master is in the offline mode when requesting the command |
| 0x0D | ST | S-7.4 protocol aborted (timeout) |
| 0x0E | IA | invalid AS-i slave address for the S-7.4 protocol (e.g. B slaves) |
| 0x10 | | AS-i S-7.4 slave deleted from LAS during current transmission |
| 0x11 | STA | another S-7.4 transfer to the addressed AS-i slave is already active |
| 0x17 | CMD_PRE | start requirements for S-7.4 command not met:<br>- wrong slave profile (is not S-7.4) or:<br>- slave is not in LAS or:<br>- master is not in the Protected mode |

## 4.3.16 Command 0x0022 – Read parameter string of an AS-i slave (S-7.4)

8830

### Command request channel (fieldbus master >>> device)

11130

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| 4 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legende:

| | | | |
|---|---|---|---|
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

11143

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | reflected user ID | | | | | | | | | | | | | | | |
| **2** | reflected command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| **4** | command error code | | | | | | | | | | | | | | | |
| **5** | Number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| **6 ... m** | Parameter byte n+1 | | | | | | | | Parameter byte n | | | | | | | |
| **(m+1) ... 120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |

## Possible command error codes

11132

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x01 | NOK | no slave response OR:<br>master is in the offline mode when requesting the command |
| 0x0D | ST | S-7.4 protocol aborted (timeout) |
| 0x0E | IA | invalid AS-i slave address for the S-7.4 protocol (e.g. B slaves) |
| 0x10 | | AS-i S-7.4 slave deleted from LAS during current transmission |
| 0x11 | STA | another S-7.4 transfer to the addressed AS-i slave is already active |
| 0x17 | CMD_PRE | start requirements for S-7.4 command not met:<br>- wrong slave profile (is not S-7.4) or:<br>- slave is not in LAS or:<br>- master is not in the Protected mode |

## 4.3.17 Command 0x0022 – Write parameter string of an AS-i slave (S-7.4)

8831

### Command request channel (fieldbus master >>> device)

11145

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | UID | | | | | | | | | | | | | | | |
| **2** | command number | | | | | | | | | | | | | | | |
| **3** | Number of bytes to be transmitted | | | | | | | | reserved | | ST | SLA | | | | |
| **4...m** | parameter byte n+1 | | | | | | | | parameter byte n | | | | | | | |
| **(m+1)...120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

The number of the bytes to be sent must be divisible by 2 since the system always transmits only multiples of 2 bytes in the S7.4 protocol.

## Command response channel (device >>> fieldbus master)

11143

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | Number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 ... m | Parameter byte n+1 | | | | | | | | Parameter byte n | | | | | | | |
| (m+1) ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |

## Possible command error codes

11146

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x01 | NOK | Slave does not answer or AS-i master switches to offline mode during command execution<br>OR:<br>Timeout of slaves, switching of operating states with As-i parameters was not processed by the slave. Calling a not supported operating state can also cause this error message. |
| 0x0C | | 7.4 sequence failed. AS-i slave generated wrong 7.4 sequence |
| 0x0D | ST | S-7.4 protocol aborted (timeout) |
| 0x0E | IA | invalid AS-i slave address for the S-7.4 protocol (e.g. B slaves) |
| 0x0F | SSA | AS-i slave has aborted the S-7.4 string |
| 0x10 | | AS-i S-7.4 slave deleted from LAS during current transmission |
| 0x11 | STA | another S-7.4 transfer to the addressed AS-i slave is already active |
| 0x12 | HSE | the previous segmented S-7.4 transfer was not yet completed |
| 0x13 | IDL | invalid S-7.4 data length |
| 0x14 | | invalid S-7.4 command |
| 0x17 | CMD_PRE | start requirements for S-7.4 command not met:<br>- wrong slave profile (is not S-7.4) or:<br>- slave is not in LAS or:<br>- master is not in the Protected mode |

## 4.3.18 Command 0x0024 – CTT2 Standard

8832

CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

### Command request channel (fieldbus master >>> device)

11148

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| 4 | DL | | | | | | | | IX | | | | | | | |
| 5 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| DL | data length | 1 byte | number of bytes to be transferred<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

18370

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | data byte 0 | | | | | | | | RC | | | | | | | |
| 7 ... m | data byte n+1* | | | | | | | | data byte n | | | | | | | |

* ... If the number of bytes to be transmitted is odd, a zero byte (= 0x00) is transmitted in the data byte n+1.

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x50 = No CTT2 error on command execution :<br>The following data bytes contain the requested data.<br>0x90 = CTT2 error on command execution:<br>- Data byte 0 contains → Standard CTT2 error codes (→ p. 62).<br>- The data in the following data bytes is irrelevant. |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.19 Command 0x0025 – CTT2 standard write

8848

### Command request channel (fieldbus master >>> device)

11152

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | UID | | | | | | | | | | | | | | | |
| **2** | command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| **4** | DL | | | | | | | | IX | | | | | | | |
| **5 ... m** | Data byte (n+1) | | | | | | | | Data byte n | | | | | | | |
| **(m+1) ... 120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| DL | data length | 1 byte | number of bytes to be transferred<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

18375

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | Command error code | | | | | | | | | | | | | | | |
| 5 | reserved | | | | | | | | reserved | | ST | Reflected slave address | | | | |
| 6 | data byte 0 | | | | | | | | RC | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x51 = No CTT2 error on command execution :<br>The data in the following data bytes is irrelevant.<br>0x91 = CTT2 error on command execution:<br>Data byte 0 contains → Standard CTT2 error codes (→ p. 62). |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.20 Command 0x0026 – CTT2 Vendor Specific Read

8849

CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

### Command request channel (fieldbus master >>> device)

11148

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| 4 | DL | | | | | | | | IX | | | | | | | |
| 5 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| DL | data length | 1 byte | number of bytes to be transferred<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

18371

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | data byte 0 | | | | | | | | RC | | | | | | | |
| 7 ... m | data byte n+1* | | | | | | | | data byte n | | | | | | | |

* ... If the number of bytes to be transmitted is odd, a zero byte (= 0x00) is transmitted in the data byte n+1.

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x52 = No CTT2 error on command execution :<br>The following data bytes contain the requested data.<br>0x92 = CTT2 error on command execution:<br>The following data bytes 0...5 contain → **CTT2 error object** (→ p. 62). |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.21 Command 0x0027 – CTT2 Vendor Specific Write

8850

CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

### Command request channel (fieldbus master >>> device)

11152

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | UID | | | | | | | | | | | | | | | |
| **2** | command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| **4** | DL | | | | | | | | IX | | | | | | | |
| **5 ... m** | Data byte (n+1) | | | | | | | | Data byte n | | | | | | | |
| **(m+1) ... 120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| DL | data length | 1 byte | number of bytes to be transferred<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

11153

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | reserved | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | Data byte 0 | | | | | | | | RC | | | | | | | |
| 7 ... m | Data byte n+1 | | | | | | | | Data byte n | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x53 = No CTT2 error on command execution :<br>The data in the following data bytes is irrelevant.<br>0x93 = CTT2 error on command execution:<br>The following data bytes 0...5 contain → CTT2 error object (→ p. 62). |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.22 Command 0x0040 – CTT2 device group read

8851

CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

### Command request channel (fieldbus master >>> device)

11148

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| 4 | DL | | | | | | | | IX | | | | | | | |
| 5 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| DL | data length | 1 byte | number of bytes to be transferred<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

18372

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | data byte 0 | | | | | | | | RC | | | | | | | |
| 7 ... m | data byte n+1* | | | | | | | | data byte n | | | | | | | |

* ... If the number of bytes to be transmitted is odd, a zero byte (= 0x00) is transmitted in the data byte n+1.

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x54 = No CTT2 error on command execution :<br>The following data bytes contain the requested data.<br>0x94 = CTT2 error on command execution:<br>The following data bytes 0...5 contain → CTT2 error object (→ p. 62). |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.23 Command 0x0041 – CTT2 Device Group Write

8852

CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

### Command request channel (fieldbus master >>> device)

11152

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | UID | | | | | | | | | | | | | | | |
| **2** | command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| **4** | DL | | | | | | | | IX | | | | | | | |
| **5 ... m** | Data byte (n+1) | | | | | | | | Data byte n | | | | | | | |
| **(m+1) ... 120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| DL | data length | 1 byte | number of bytes to be transferred<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

18386

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | reserved | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | data byte 0 | | | | | | | | RC | | | | | | | |
| 7 ... m | data byte n+1 | | | | | | | | data byte n | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x55 = No CTT2 error on command execution :<br>The data in the following data bytes is irrelevant.<br>0x95 = CTT2 error on command execution:<br>The following data bytes 0...5 contain → CTT2 error object (→ p. 62). |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.24 Command 0x0042 – CTT2 Vendor Specific Selective Read From Buffer

8853

CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

### Command request channel (fieldbus master >>> device)

11159

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | UID | | | | | | | | | | | | | | | |
| **2** | command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| **4** | SIX | | | | | | | | IX | | | | | | | |
| **5 ... m** | reserved | | | | | | | | DL | | | | | | | |
| **(m+1) ... 120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| DL | data length | 1 byte | number of bytes to be transferred<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SIX | sub-index | 1 byte | pointer on element on this page (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

18387

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | data byte 0 | | | | | | | | RC | | | | | | | |
| 7 ... m | data byte n+1 | | | | | | | | data byte n | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x58 = No CTT2 error on command execution :<br>The following data bytes contain the requested data.<br>0x98 = CTT2 error on command execution:<br>The following data bytes 0...5 contain → CTT2 error object (→ p. 62). |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.25 Command 0x0043 – CTT2 Vendor Specific Selective Write From Buffer

8855

CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

### Command request channel (fieldbus master >>> device)

11162

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | UID | | | | | | | | | | | | | | | |
| **2** | command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| **4** | SIX | | | | | | | | IX | | | | | | | |
| **5** | Data byte 0 | | | | | | | | DL | | | | | | | |
| **6 ... m** | Data byte (n+1) | | | | | | | | Data byte n | | | | | | | |
| **(m+1) ... 120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legende:

| | | | |
|---|---|---|---|
| DL | data length | 1 byte | number of bytes to be transferred<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SIX | sub-index | 1 byte | pointer on element on this page (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

18388

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | data byte 0 | | | | | | | | RC | | | | | | | |
| 7 ... m | data byte n+1 | | | | | | | | data byte n | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x59 = No CTT2 error on command execution :<br>Data byte 0 contains the number of bytes to be read (block length); Valid values: 0x00 ... 0xFF (→ data sheet of the AS-i slave)<br>0x99 = CTT2 error on command execution:<br>The following data bytes 0...5 contain → **CTT2 error object** (→ p. 62). |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.26 Command 0x0044 – CTT2 Vendor Specific Selective Read

8857

CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

### Command request channel (fieldbus master >>> device)

11159

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | UID | | | | | | | | | | | | | | | |
| **2** | command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| **4** | SIX | | | | | | | | IX | | | | | | | |
| **5 ... m** | reserved | | | | | | | | DL | | | | | | | |
| **(m+1) ... 120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| DL | data length | 1 byte | number of bytes to be transferred<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SIX | sub-index | 1 byte | pointer on element on this page (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

18387

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | data byte 0 | | | | | | | | RC | | | | | | | |
| 7 ... m | data byte n+1 | | | | | | | | data byte n | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x58 = No CTT2 error on command execution :<br>The following data bytes contain the requested data.<br>0x98 = CTT2 error on command execution:<br>The following data bytes 0...5 contain → **CTT2 error object** (→ p. 62). |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.27 Command 0x0045 – CTT2 Vendor Specific Selective Write

8858

CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

### Command request channel (fieldbus master >>> device)

11162

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | UID | | | | | | | | | | | | | | | |
| **2** | command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| **4** | SIX | | | | | | | | IX | | | | | | | |
| **5** | Data byte 0 | | | | | | | | DL | | | | | | | |
| **6 ... m** | Data byte (n+1) | | | | | | | | Data byte n | | | | | | | |
| **(m+1) ... 120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legende:

| | | | |
|---|---|---|---|
| DL | data length | 1 byte | number of bytes to be transferred<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SIX | sub-index | 1 byte | pointer on element on this page (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

18388

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | data byte 0 | | | | | | | | RC | | | | | | | |
| 7 ... m | data byte n+1 | | | | | | | | data byte n | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x59 = No CTT2 error on command execution :<br>Data byte 0 contains the number of bytes to be read (block length); Valid values: 0x00 ... 0xFF (→ data sheet of the AS-i slave)<br>0x99 = CTT2 error on command execution:<br>The following data bytes 0...5 contain → CTT2 error object (→ p. 62). |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.28 Command 0x0046 – CTT2 device group selective Rread

8857

CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

### Command request channel (fieldbus master >>> device)

11159

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | UID | | | | | | | | | | | | | | | |
| **2** | command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| **4** | SIX | | | | | | | | IX | | | | | | | |
| **5 ... m** | reserved | | | | | | | | DL | | | | | | | |
| **(m+1) ... 120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| DL | data length | 1 byte | number of bytes to be transferred<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SIX | sub-index | 1 byte | pointer on element on this page (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

18392

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | data byte 0 | | | | | | | | RC | | | | | | | |
| 7 ... m | data byte n+1 | | | | | | | | data byte n | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x5A = No CTT2 error on command execution :<br>The following data bytes contain the requested data.<br>0x9A = CTT2 error on command execution:<br>The following data bytes 0...5 contain → CTT2 error object (→ p. 62). |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.29 Command 0x0047 – CTT2 Device Group Selective Write

8860

CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

### Command request channel (fieldbus master >>> device)

11162

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | UID | | | | | | | | | | | | | | | |
| **2** | command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| **4** | SIX | | | | | | | | IX | | | | | | | |
| **5** | Data byte 0 | | | | | | | | DL | | | | | | | |
| **6 ... m** | Data byte (n+1) | | | | | | | | Data byte n | | | | | | | |
| **(m+1) ... 120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legende:

| | | | |
|---|---|---|---|
| DL | data length | 1 byte | number of bytes to be transferred<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SIX | sub-index | 1 byte | pointer on element on this page (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

18391

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | data byte 0 | | | | | | | | RC | | | | | | | |
| 7 ... m | data byte n+1 | | | | | | | | data byte n | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x5B = No CTT2 error on command execution :<br>Data byte 0 contains the block length (= number of bytes to be read); Valid values: 0x00 ... 0xFF (→ data sheet of the AS-i slave)<br>0x9B = CTT2 error on command execution:<br>The following data bytes 0...5 contain → CTT2 error object (→ p. 62). |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.30 Command 0x0049 – CTT2 Vendor Specific Exchange

8863

CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

### Command request channel (fieldbus master >>> device)

11168

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | UID | | | | | | | | | | | | | | | |
| **2** | command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| **4** | RL | | | | | | | | IX | | | | | | | |
| **5** | Data byte 0 | | | | | | | | WL | | | | | | | |
| **6 ... m** | Data byte (n+1) | | | | | | | | Data byte n | | | | | | | |
| **(m+1) ... 120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legende:

| | | | |
|---|---|---|---|
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| RL | read length | 1 byte | number of bytes to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |
| WL | write length | 1 byte | number of bytes to be written<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |

## Command response channel (device >>> fieldbus master)

18389

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | data byte 0 | | | | | | | | RC | | | | | | | |
| 7 ... m | data byte n+1* | | | | | | | | data byte n | | | | | | | |

* ... If the number of bytes to be transmitted is odd, a zero byte (= 0x00) is transmitted in the data byte n+1.

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x5D = No CTT2 error on command execution<br>The following data bytes contain the requested data.<br>0x9D = CTT2 error on command execution<br>The following data bytes 0...5 contain → CTT2 error object (→ p. 62). |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.31 Command 0x004A – CTT2 Device Group Exchange

8866

CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

### Command request channel (fieldbus master >>> device)

11168

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | UID | | | | | | | | | | | | | | | |
| **2** | command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| **4** | RL | | | | | | | | IX | | | | | | | |
| **5** | Data byte 0 | | | | | | | | WL | | | | | | | |
| **6 ... m** | Data byte (n+1) | | | | | | | | Data byte n | | | | | | | |
| **(m+1) ... 120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legende:

| | | | |
|---|---|---|---|
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| RL | read length | 1 byte | number of bytes to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |
| WL | write length | 1 byte | number of bytes to be written<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |

## Command response channel (device >>> fieldbus master)

18390

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | data byte 0 | | | | | | | | RC | | | | | | | |
| 7 ... m | data byte n+1* | | | | | | | | data byte n | | | | | | | |

* ... If the number of bytes to be transmitted is odd, a zero byte (= 0x00) is transmitted in the data byte n+1.

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x5E = No CTT2 error on command execution :<br>The following data bytes contain the requested data.<br>0x9E = CTT2 error on command execution:<br>The following data bytes 0...5 contain → CTT2 error object (→ p. 62). |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.32 Command 0x004B – CTT2 Device Group Selective Read From Buffer

8861

CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

### Command request channel (fieldbus master >>> device)

11159

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | UID | | | | | | | | | | | | | | | |
| **2** | command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| **4** | SIX | | | | | | | | IX | | | | | | | |
| **5 ... m** | reserved | | | | | | | | DL | | | | | | | |
| **(m+1) ... 120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| DL | data length | 1 byte | number of bytes to be transferred<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SIX | sub-index | 1 byte | pointer on element on this page (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

18392

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | data byte 0 | | | | | | | | RC | | | | | | | |
| 7 ... m | data byte n+1 | | | | | | | | data byte n | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x5A = No CTT2 error on command execution :<br>The following data bytes contain the requested data.<br>0x9A = CTT2 error on command execution:<br>The following data bytes 0...5 contain → CTT2 error object (→ p. 62). |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.33 Command 0x004C – CTT2 Device Group Selective Write From Buffer

8862

CTT2 profiles = S-7.5.5, S-7.A.5 or S-B.A.5

### Command request channel (fieldbus master >>> device)

11162

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| **1** | UID | | | | | | | | | | | | | | | |
| **2** | command number | | | | | | | | | | | | | | | |
| **3** | reserved | | | | | | | | reserved | | ST | SLA | | | | |
| **4** | SIX | | | | | | | | IX | | | | | | | |
| **5** | Data byte 0 | | | | | | | | DL | | | | | | | |
| **6 ... m** | Data byte (n+1) | | | | | | | | Data byte n | | | | | | | |
| **(m+1) ... 120** | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legende:

| | | | |
|---|---|---|---|
| DL | data length | 1 byte | number of bytes to be transferred<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| IX | index | 1 byte | pointer to the page to be read<br>permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave) |
| SIX | sub-index | 1 byte | pointer on element on this page (→ data sheet of the slave) |
| SLA | slave address | 5 bits | 0x00…0x1F = 0…31 |
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| UID | user ID | 1 word | 0x0000…0xFFFF = 0…65535<br>The user ID ensures clear identification of the commmand response data of the command request data sent before. The user can assign any user ID in the command request. The AS-i master reflects the user ID from the command request into the corresponding command response. |

## Command response channel (device >>> fieldbus master)

18391

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | Command status (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |
| 5 | number of bytes received | | | | | | | | reserved | | ST | reflected slave address | | | | |
| 6 | data byte 0 | | | | | | | | RC | | | | | | | |
| 7 ... m | data byte n+1 | | | | | | | | data byte n | | | | | | | |

Legend:

| | | | |
|---|---|---|---|
| ST | slave type | 1 bit | 0 = single slave or A slave<br>1 = B slave (= addition of 0x1F to the slave address) |
| RC | CTT2 Response Code | 1 byte | 0x5B = No CTT2 error on command execution :<br>Data byte 0 contains the block length (= number of bytes to be read); Valid values: 0x00 ... 0xFF (→ data sheet of the AS-i slave)<br>0x9B = CTT2 error on command execution:<br>The following data bytes 0...5 contain → CTT2 error object (→ p. 62). |

## Possible command error codes

11150

| Error code | Error | Description |
|---|---|---|
| 0x00 | | No fault |
| 0x0A | NA | Slave is not in the LAS |
| 0x14 | IC | Invalid S-7.4 command |
| 0x17 | CMD_PRE | Start requirements for S-7.4 command not met:<br>- Wrong slave profile (is not S-7.4) or:<br>- Slave is not in LAS or:<br>- Master is not in the protected mode |
| 0xE1 | CTT2_ACYCL_RD_NOK | Command execution error |
| 0xE2 | CTT2_ACYCL_CMD_NOK | Invalid command |
| 0xE3 | CTT2_ACYCL_RESP_NOK | Wrong response data or internal error |
| 0xE4 | CTT2_ACYCL_WR_LEN_NOK | Wrong data length when writing |
| 0xE5 | CTT2_ACYCL_STATE_NOK | Invalid state of the CTT2 state machine when executing the command |
| 0xE6 | CTT2_ACYCL_STATE_RESET | Reset when executing the command |
| 0xE7 | CTT2_ACYCL_RD_LEN_NOK | Wrong data length when reading |
| 0xE8 | CTT2_ACYCL_RD_WR_LEN_NOK | Wrong data length when reading / writing |
| 0xEF | CTT2_ACYCL_CMD_TIMEOUT | Timeout |

## 4.3.34 Command 0x0050 – Adjust AS-i master settings

16772

### Command request channel (fieldbus master >>> device)

16774

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 | Setting | | | | | | | | Reserved | | | | | | | MOD |
| 4 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

Legend:

| | | |
|---|---|---|
| Setting | Selection of the diagnostic function | 0x01 = ground-fault detection (EE)<br>0x02 = double address recognition (DAE) |
| MOD | Activate/deactivate the selected diagnostic function in the settings | 0 = deactivate function<br>1 = activate function |

### Command response channel (device >>> fieldbus master)

16775

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

### Possible command error codes

16776

| Error Code | Error | Description |
|---|---|---|
| 0x00 | | no error |
| 0x01 | IP | Wrong parameter assigned. Setting was not adopted. |

## 4.3.35 Command 0x0051 – Reset error counter

16773

Command sets the following counters to 0:

- Telegram errors
- All slave telegram errors
- Configuration errors
- Voltage drops < 22.5 V
- Voltage drops < 19.0 V
- Earth faults
- Error distribution telegram errors

### Command request channel (fieldbus master >>> device)

16778

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | UID | | | | | | | | | | | | | | | |
| 2 | command number | | | | | | | | | | | | | | | |
| 3 ... 120 | The area is completely ignored.<br>It does not matter whether the data area exists or what data is contained. | | | | | | | | | | | | | | | |

### Command response channel (device >>> fieldbus master)

16779

| Offset Word no. | Bit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 1 | reflected user ID | | | | | | | | | | | | | | | |
| 2 | reflected command number | | | | | | | | | | | | | | | |
| 3 | reserved | | | | | | | | **Command status** (→ p. 37) | | | | | | | |
| 4 | command error code | | | | | | | | | | | | | | | |

### Possible command error codes

11101

There are no error messages for this command.

# 5 Index

## A



## C



## D



## E



## G



## H



## I



## L



## M

## O



## P



## R



## S



## W

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