ifm electronic

设备手册

SmartSPS AC14

带有 Profinet 接口

ecomat300

AC1401

AC1402

Master profile: M4

固件: ≥ 3.1.2

中文

7391059_00_CN 2017-11-20

内容

1 初步说明

内容

6919

1.1 法律和版权信息

6088

1.2 文档用途

6921

此文档适用于固件版本从 3.1.2 起的“带有 Profinet 接口的智能 PLC AC14” 类型设备（货号：AC1401/AC1402）。

这些说明描述以下主题：

- 经由菜单（GUI 和 Web 界面）执行的设备操作和配置
- 命令通道、循环和非循环数据记录
- 故障诊断和故障排除

1.3 使用的符号和格式

953

⚠ 警告

这种伤害是指死亡或永久性的伤残。

⚠ 小心

可能导致轻微伤害。

通知

财产损失是在意料之中或可能会造成的。

重要说明
如不遵守，可能导致故障或干扰

信息
补充说明

► ... 操作请求

> ... 反应，结果

→ ... “请查阅”

abc 参照

123 十进制数
0x123 十六进制数
0b010 二进制数

[...] 按键、按钮或指示标记

1.4 概览： AC14 的用户文档

991

IFM 电子提供“智能 PLC AC14”设备型号类别的以下用户文档：

文档	内容 / 描述
技术资料	表格形式的 AC140n 技术资料
操作说明 *	▪ 有关 AC140n 的安装和电气安装之注意事项 ▪ 设定、操作和显示元件的描述、维护信息、尺寸图
设备手册	▪ 有关经由 GUI 和 Web 界面执行的 AC140n 操作之注意事项 ▪ 循环和非循环数据记录、现场总线参数和命令接口的描述 ▪ 故障描述
编程手册	▪ 有关 CODESYS 中 AC140n 系统配置的注意事项 ▪ 有关 AC140n 的 PLC 编程之注意事项 ▪ 特定设备 CODESYS 功能库的描述

说明：
*... 设备随附操作说明。

所有文档均可从 IFM 的网站下载。
→ www.ifm.com > 选择国家 > [技术资料查询] > (货号) > [操作使用说明书]

1.5 开始使用

6922

安装说明和有关设备电气安装的注意事项可在随附的操作说明中找到。 如果您忘记将说明放在何处，则可从 IFM 网站下载：
→ www.ifm.com > 选择国家 > [技术资料查询] > (货号) > [操作使用说明书]

了解图形用户界面 (→ **操作注意事项**)!

图形用户界面的菜单功能在以下章节中描述 → **菜单** (→ 页 49).

如需有关安装和电气连接后的设备设定之信息，请参阅以下章节 → **设定** (→ 页 122).

如需使用 CODESYS 执行装置内部 PLC 的编程之相关信息，请参阅编程手册：
→ www.ifm.com > 选择国家 > [技术资料查询] > (货号) > [操作使用说明书]

1.6 修改历史记录

998

版本	主题	日期
1.0	文档的新建	24/10/2014
2.0	固件 3.1.2 提供的新功能 ▪ IFM 系统解决方案 ▪ 诊断协议 ▪ 从开始屏幕访问 OSC ▪ 循环现场总线数据的描述 ▪ 非循环现场总线数据（命令接口）的描述	05/10/2015

2 安全说明

内容

213

2.1 所需的背景知识

13323

本文档供拥有控制技术和根据 IEC 61131-3 编程的知识之人员使用。

若要为 PLC 编程，这些人员还应了解 CODESYS 软件。

本文档供专业人士使用。 专业人士是指基于其相关培训和经验，能够识别和避免在操作或维护产品期间可能会造成的风险及潜在危险之人员。 本文档包含正确操作产品的相关信息。

► 使用产品前请阅读本文档，以了解操作条件、安装和操作。 使用装置期间，请始终妥善保管本文档。

► 请遵守安全说明。

2.2 请注意

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11212

本手册中提供信息、注意事项和示例并不对任何特性作出担保。 并不通过提供的图纸、展示和示例，为系统承担任何责任，且提供的图纸、展示和示例也未将任何特定应用的特殊性考虑在内。

► 机器/设备的制造商应负责确保机器/设备的安全。

► 遵守机器/装置投放至市场所在国家的国内和国际法规。

⚠ 警告

未遵守这些说明可能会导致财产损失或人身伤害。
ifm electronic gmbh 不承担此方面的任何责任。

► 对此装置和使用其执行工作前，操作者必须已阅读并理解安全说明和本手册中的相应章节。

► 操作者必须获得对该机器/设备执行工作的授权。

► 操作者必须已获得执行此工作所需的资质和培训。

► 遵照装置的技术资料操作！
您可在此处的 **IFM** 主页上找到当前的技术资料：
→ www.ifm.com > 选择您所在国家 > [技术资料查询] > (货号。) > [PDF 技术资料]

► 注意安装和配线信息，以及装置的功能和特性！
→ 随附的安装说明或在 **IFM** 的主页上：
→ www.ifm.com > 选择您所在国家 > [技术资料查询] > (货号。) > [操作使用说明书]

► 请注意 **IFM** 网站上提供的现有文档发行说明中的修正内容和注意事项：
→ www.ifm.com > 选择您所在国家 > [技术资料查询] > (货号。) > [操作使用说明书]

2.3 擅自改装设备

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⚠ 警告

擅自改装设备可能会影响操作员和机械的安全！

请勿擅自改装设备。

若不遵守此要求，我们概不负责且保修将失效。

- ► 请勿打开装置！
- ► 请勿将任何物体插入装置！
- ► 防止金属异物进入！

2.4 控制器的启动运行状况

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15233
11575

⚠ 警告

由于机器或设备部分意外和危险启动导致的危险！

- ► 创建程序时，程序员必须确保发生故障（例如紧急停机）和随后执行故障排除后，机器或设备部分不会发生任何意外和危险启动！
  - ⇨ 实现重新启动抑制。
- ► 发生错误时，在程序中将相关的输出功能设为“错误”！

诸如以下情况可能会导致重新启动：

- 供电中断后电压恢复
- 由于周期时间过长，电子狗反应后复位
- 紧急停机后的错误排除

若要确保控制器的安全运行状况：

- ► 在应用程序中监控电压供应器。
- ► 若发生错误，在应用程序中关闭所有相关的输出功能。
- ► 在应用程序（反馈）中监控可能会导致危险移动的执行器。
- ► 在应用程序（反馈）中监控可能会导致危险移动的继电器触点。
- ► 如有必要，在应用程序中确保焊接的继电器触点无法触发或继续危险移动。

3 系统描述

内容

975

3.1 指定用途

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通知

装置过载或使用不正确时的危险。

如果超过此装置“技术资料”中的限值或在指定的“预期用途”以外使用装置，则装置和/或相关的机器/设备可能会损坏或损毁或是可能会发生故障。

► 仅在**技术资料** (→ 页 146) (→ 技术资料) 的限值范围内使用装置。

► 仅按“预期用途”使用装置。

3.1.1 允许的用途

6928

您可将设备用于以下用途 (= 指定用途) ：

- 作为经由现场总线接口 Profinet 的 AS-i 网络与更高级控制器(Profinet-控制器 = 主机； 例如 PLC) 之间的网关。
- 作为对已连接至设备的 AS-i 从站执行基于程序的参数设定、控制和调节之可编程逻辑控制器 (PLC)。

设备提供以下特性：

- 带有 Profinet 接口的 SmartPLC 集成了以下组件：
  – AC1401: 1 个 AS-i 主站
  – AC1402: 2 个 AS-i 主站
  – 基于软件的可编程逻辑控制器 (PLC)
  – Web 服务器
  – 带有双端口开关的 Profinet 接口
  – 以太网配置接口
- 控制传感器/执行器的信号传输。
- 通过 Profinet 与更高级的控制级别通信。
- 它将集成 Web 服务器上的传感器/执行器数据可视化。
- 它允许通过 WEB 服务器进行设备配置。

3.1.2 禁止用途

5320

您“不得”将装置用于以下领域：

- 户外，
- 超过技术资料（→ 技术资料）的限值范围。

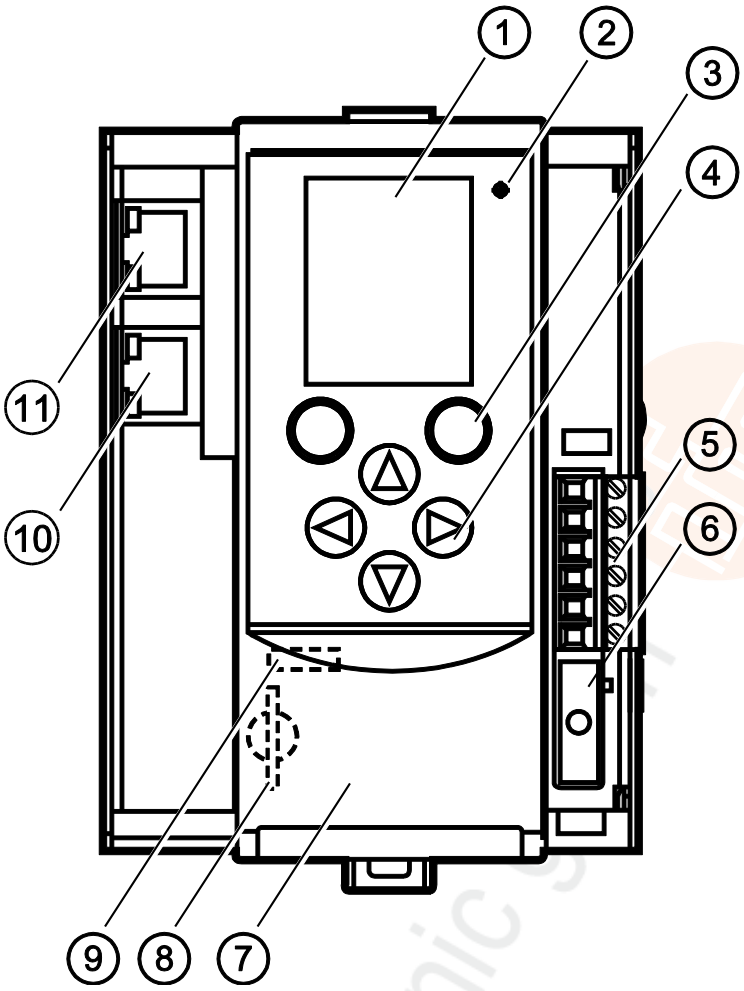
3.2 有关装置的信息

内容

5330

3.2.1 AS-i 设备上有什么，位于何处？

12112



说明：

1. 显示屏
2. 状态 LED (H1)
3. 2 个功能键
4. 4 个箭头键
5. 适用于 AS-i 1、AS-i 2、功能接地线的
6. 适用于辅助设备（此处配有辅助设备跳线）的连接器 (X2)
7. 前盖
8. SD 卡槽（位于前盖后）
9. EtherNet 配置接口 (X3)(位于前盖后)
10. 带有状态 LED (H4，H5) 的 Profinet 接口 1 (X7)
11. 带有状态 LED (H2，H3) 的 Profinet 接口 2 (X6)

3.2.2 操作元件

15840

装置提供以下操作元件。

箭头和功能键

15867

显示屏下方是带有两个功能键和四个箭头键的键板。 操作员通过按键控制图形用户界面 (GUI)。

技术资料： → **操作**

3.2.3 显示元件

7062

装置提供以下显示元件：

显示屏

7083

显示屏用于显示装置的图形用户界面 (GUI)。

操作注意事项： → ***操作*** (→ 页 21)

技术资料： → ***Display elements*** (→ 页 147)

状态 LED

18985

装置具有显示系统组件当前状态的以下状态 LED。

LED 颜色和闪烁频率的含义： → **状态 LED** (→ 页 139)

3.2.4 CODESYS PLC

7095

设备配备可编程逻辑控制器 (PLC)。 PLC 可运行已使用符合 IEC 61131-3 的编程软件“CODESYS 开发系统”（从 3.5 SP4 patch 2 版本起）创建的应用程序（应用）。

技术资料： → **可编程序逻辑控制器 (PLC)** (→ 页 148)

如需使用 CODESYS 执行装置内部 PLC 的编程之相关信息，请参阅编程手册：
→ www.ifm.com > 选择国家 > [技术资料查询] > （货号） > [操作使用说明书]

3.2.5 接口

15839

设备提供以下接口：

以太网配置接口

6982

配置接口 (X3) 位于装置前盖后方。 它可供用户使用以下装置功能：

- 装置配置和诊断的 Web 界面
- 使用 CODESYS 执行装置内部 PLC 的编程
- 作为现场总线接口的配置

可能的网络拓扑： → ***Configuration interface: connection concepts*** (→ 页 150)

技术资料： → **Interfaces** (→ 页 147)

Profinet 现场总线接口

12113

装置通过 Profinet 接口 (X6/X7) 与 Profinet 网络的更高级别控制实例通信。

- 有关连接理念的注意事项： → ***Configuration interface: connection concepts*** (→ 页 150)
- 技术资料： → **Interfaces** (→ 页 147)

SD 卡槽

9135

SD 卡槽 (X5) 位于设备前盖后。 以下操作可使用 SD 卡来执行：

- 更新设备固件
- 保存/恢复设备配置

技术资料： → **Interfaces** (→ 页 147)

3.2.6 所需附件

6926

若要能以合理的方式操作设备，您需要以下附件（未随设备提供）：

- 视所选电源电压而定（→ 操作说明），您需要：
  - 适用于 24 V 电源的电源供应器（例如，货号 DN3011）
  - 对于每个 AS-i 主站，每个主站提供一个 AS-i 电源供应器（例如，货号 AC1236）
  - 数据解耦模块 AC1250（附件，可选）
- AS-i 从站。

4 操作

内容

14805

4.1 图形用户界面的控件

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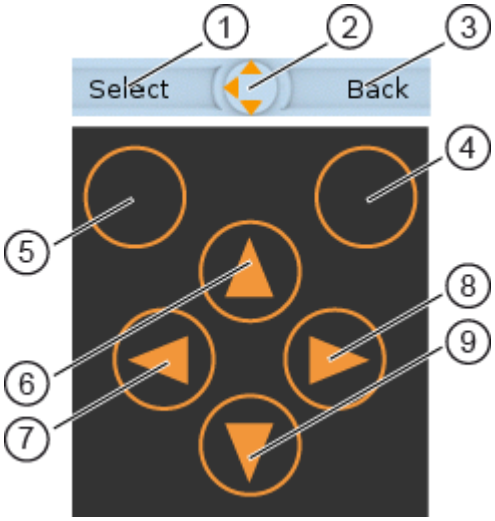
显示屏下方是带有六个薄膜键的键板。 操作员通过这些按键控制装置的图形用户界面。 键板与导航状态栏紧密相连。



说明：

1. 标签左侧功能键
2. 导航罗盘
3. 标签右侧功能键
4. 右侧功能键
5. 左侧功能键
6. [▲] 箭头键
7. [◀] 箭头键
8. [▶] 箭头键
9. [▼] 箭头键

4.1.1 功能键

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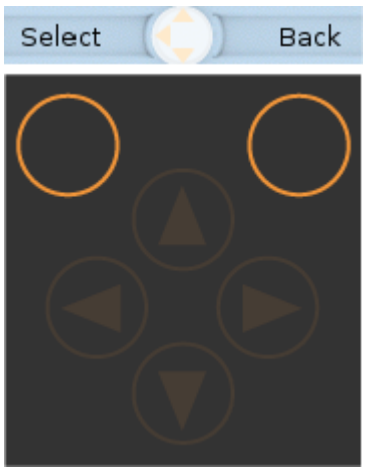


两个**功能键**可供操作员触发指定操作（例如勾选复选框）。 功能键的功能视情况而变。

导航状态栏中的两个文本字段与位于显示屏正下方的功能键关联。 它们指示在当前工作步骤中按下功能键时会触发的操作。 如果功能键未附标签，那么这意味着它在目前情况下没有任何功能。

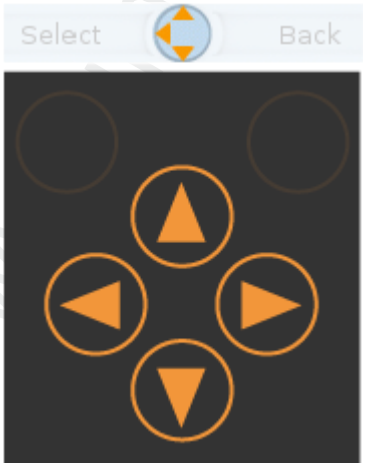
示例（→ 图解）：

► 左侧功能键触发操作 [Select]。

► 右侧功能键触发操作 [Back]。

4.1.2 箭头键

7091



四个**箭头键** [▲]、[▶]、[▼] 和 [◀] 可用于导航和选择。

导航罗盘显示四个 箭头键中的哪一个可以用于相应的工作步骤。

示例：

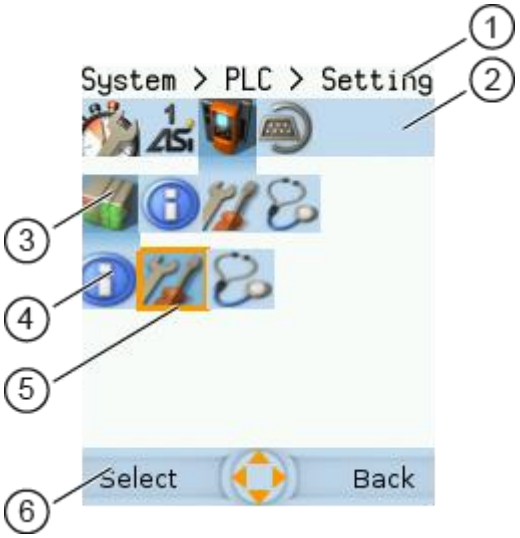
所有箭头键已启用且按下时会触发装置反应。

仅箭头键 [▶] 和 [▼] 已启用且按下时会触发装置反应。

4.2 菜单视图

6996

菜单视图让用户可选择带有所需控件或显示功能的菜单页面。



说明：

1. 信息栏
2. 主导航栏
3. 子导航栏 1
4. 子导航栏 2
5. 所选菜单项目（焦点）
6. 导航状态栏，带有
   - 功能键的标签显示
   - 导航罗盘

长文本在信息栏中显示为滚动文本。

4.2.1 菜单导航

10967

菜单视图中的中央操作元件为三个**导航栏**。 它们反映装置软件的菜单结构。 每个导航栏表示一个菜单级别。 导航栏中的符号表示子菜单和菜单项目。

菜单导航的规则：

► 使用 [◀]/[▶] 在菜单级别内导航。

> 所选符号为**焦点所在处**（= 橙色框）。

> 如果所选符号有子菜单，则相应的**子导航栏**会自动显示。

► 使用 [▼] 来转到下一级菜单。

► 使用 [▲] 来转到上一级菜单。

在最低菜单级别：

► 按 [Select] 功能键 以转到所选菜单项目的页面（→ ***页面视图*** (→ 页 27)）。

在主导航栏中：

► 按 [Back] 功能键 以返回开始屏幕（→ **开始屏幕** (→ 页 50)）。

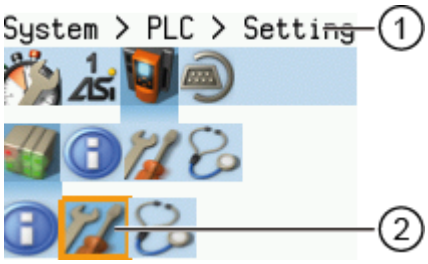
4.2.2 导航帮助

15830

以下屏幕元素帮助您在菜单中导航：

> **信息栏**显示所选菜单符号的导航路径。

> **导航罗盘**显示从当前位置可执行的导航步骤。



说明：

① 信息栏

焦点所在菜单元素的导航路径：
[System] > [PLC] > [Setup]

② 带有焦点的菜单元素

焦点所在菜单元素的导航路径：


示例

11770

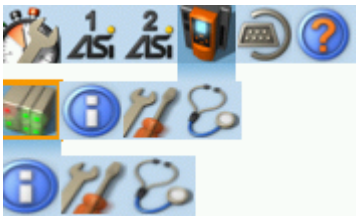
若要访问包含装置内部 PLC 设定选项的菜单页面：

1. > 访问菜单屏幕时的初始位置

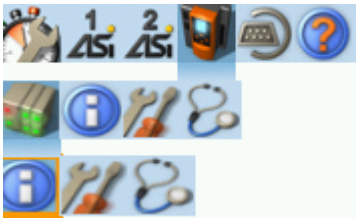
2. ► 使用 [▶] 来选择 [系统] 菜单符号。
   > 焦点位于 [系统] 菜单符号上。
   > 第一个子导航栏显示。

3. ► 使用 [▼] 以切换至第一个导航栏。
   > 焦点位于 [Diagnosis] 菜单符号上。

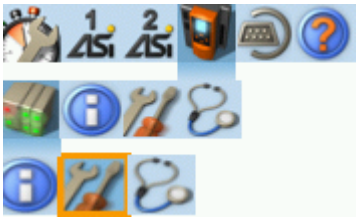
4. ► 使用 [◀] 来选择 [PLC] 菜单符号。
   > 焦点位于 [PLC] 菜单符号上。
   > 第二个子导航栏显示。



5. ► 使用 [▼] 以切换至第二个导航栏。
   > 焦点位于 [Information] 菜单符号上。



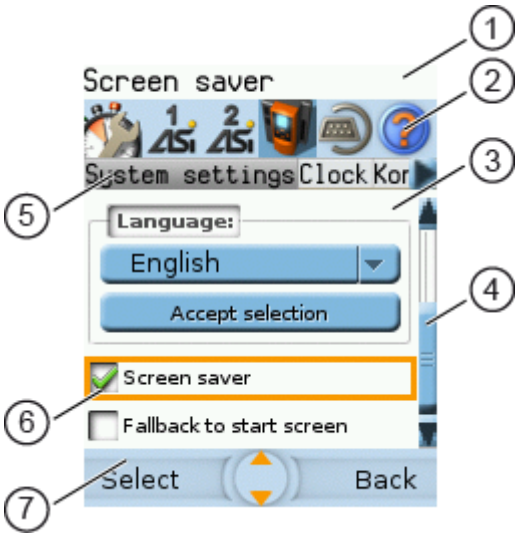
6. ► 使用 [▶] 来选择 [设定] 菜单符号。
   > 焦点位于 [设定] 菜单符号上。
   ► 按 [Select] 功能键以转到 [设定] 菜单项目的页面视图。
   > 该页面显示装置内部 PLC 的设定选项。



4.3 页面视图

7717

页面视图让用户可选择和执行所请求的功能。



说明：

1. 信息栏
2. 主导航栏
3. 页面
4. 滚动条
5. 选项卡菜单
6. 带有焦点的页面元素
7. 导航状态栏，带有
   - 功能键的标签显示
   - 导航罗盘

4.3.1 在页面上导航

15831

该页面包含可供操作员控制装置或访问信息的元素。

对于页面导航，以下基本原则适用：

► 使用箭头键 [▼]/[▲] 来在不同页面元素之间切换。

> 所选元素已标记（= 橙色框）。

► 使用 [Back] 功能键 以返回选项卡菜单/菜单视图。

使用不同控件元素的规则： →***控件元素的描述*** (→ 页 29)

4.3.2 使用导航帮助

14838

以下帮助为导航用户提供额外的情况介绍：

> **信息栏**显示有关所选元素（焦点）的详细信息。

长文本在信息栏中显示为滚动文本。

> **主导航栏**中的活动菜单符号为深色背景。
> 如果元素不适用于页面，则**滚动条**将显示于屏幕右侧。
> **导航罗盘**显示活动工作步骤中的导航选项。
> **导航状态栏中的文本字段**显示功能键的当前指定情况。

4.3.3 控件元素的描述

内容

7013

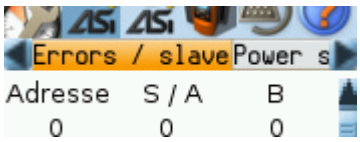
页面包含不同的控件元素。

选项卡菜单/选项卡

8737

选项卡菜单将菜单页面的不同功能组合在一起。 选项卡菜单包含至少两个选项卡。 选项卡将相关功能相结合。

示例：



> 焦点所在的选项卡为橙色背景
> 信息栏显示活动选项卡的名称（在此示例中： 错误/从站）。
> 符号 ◀ 和 ▶ 指示在可见选项卡的左侧和右侧有更多选项卡。
> 页面显示属于当前所选选项卡的控件元素。

选项卡可能有以下背景颜色：

Version = 选项卡为焦点所在处。

Version = 选项卡处于活动状态

Version = 选项卡处于非活动状态

使用：

1 **选择菜单项目**

► 通过选项卡菜单转到菜单项目。

> 选项卡菜单将显示。

> 焦点位于左侧选项卡上。

2 **选择选项卡**

► 使用 [◀] / [▶] 箭头键 来选择所需的选项卡。

> 焦点（橙色背景）移至所选选项卡：
Version

> 页面显示所选选项卡的功能。

3 **激活菜单页面**

► 按 [Select] 功能键 以转到属于活动选项卡的页面。

> 转到该页面时，选项卡菜单保持可见。

> 活动选项卡的背景颜色变为灰色。
Version

4 **执行所需功能**

► 使用 [▼] 来选择和执行所需功能。

5 切换至选项卡菜单

► 按 [Back] 功能键 以切换至选项卡菜单。

> 焦点（橙色背景）移至活动选项卡。

按钮

14196

按钮让操作员可执行一次指定操作。 按钮上的标题描述该操作。

示例：

使用：

1 选择按钮

► 使用箭头键 [▲]/[▼] 来选择按钮。

> 所选按钮将获得橙色框：

2 激活按钮

► 使用 [Select] 功能键 来激活所选按钮。

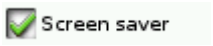
> 将执行功能。

复选框

7038

复选框让用户可激活/禁用参数。 复选框控件元素包含复选框和标题。

示例：



使用：

1 **选择复选框**

► 使用 箭头键 [▲] / [▼] 来选择复选框

> 焦点（橙色框）移至所选复选框

“或”：

2 **选中/取消选中复选框**

► 使用 功能键 [Select] 来选中/取消选中所选复选框。

> 将指示状态变化：

 = 已选中复选框

“或”：

 = 已取消选中复选框

复选框的设定或清除并不总是会立即生效。 通常必须通过单击按钮（例如 [Accept selection]）来确认更改！

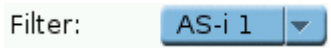
列表

7042

列表提供一个已定义值集。 操作员可以从此集中精确选择一个值（= n 个选择项目中的 1 个）。

示例：

= 无标题列表



= 带标题列表

使用：

1 **选择**列表

► 使用 箭头键 [▲] / [▼] 来选择列表。

> 焦点（橙色框）移至所选列表。

> 列表显示活动值：（在此示例中为网关）。

2 激活列表

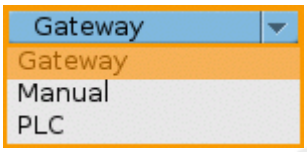
► 使用 功能键 [Select] 来打开列表。

> 打开的列表显示所选值。

3 **选择值**

► 使用 箭头键 [▲] / [▼] 来从列表中选择所需的值。

> 所选值的背景颜色变为橙色。



4 **应**用所**选值**

► 使用 功能键 [Select] 来应用所选值。

“或”：

使用 功能键 [Back] 来退出和关闭列表。

> 列表显示所选值。

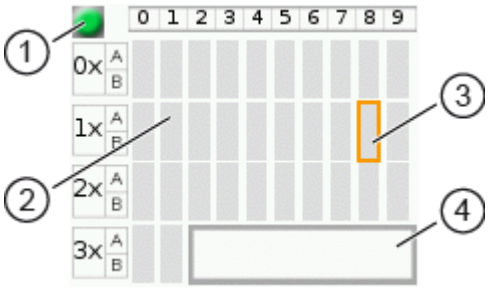
设定值不会始终立即生效。 通常必须通过单击按钮（例如 [Accept selection]）来确认更改！

从站选择器

内容

7018

从站选择器用于选择 AS-i 从站或 AS-i 地址。



说明：

1. AS-i 从站工作模式的指示器
2. AS-i 地址符号
3. 高亮显示的 AS-i 地址（焦点）
4. 高亮显示的 AS-i 地址之状态消息

> **状态 LED** 指示 AS-i 主站的活动工作模式：
  = 保护模式下的 AS-i 主站
  = 计划模式下的 AS-i 主站

> 每个字段表示一个 **AS-i 地址。** AS-i 地址可能被以下项目占用：
  – 单主站符号
  – A/B 从站对符号

> 行和列标题可帮助定位 AS-i 地址。

  示例：图中所选字段的地址
  – 行标题： 1x（= AS-i 地址的十位数）
  – 列标题： 8（= AS-i 地址的个位数）
  – 从站类型：单从站（= 符号完全占用地址字段）
  – 产生的 AS-i 地址： 18

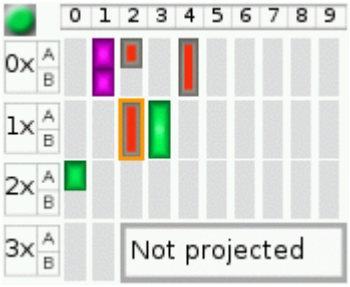
> A 或 B 从站用于此地址时，将显示 A/B 从站对的符号。

从站选择器用于以下概览中：

- 从站状态概览（→ ***从站状态概览：*** (→ 页 35)）
- 可用从站地址概览（→ ***可用从站地址概览*** (→ 页 37)）

从站状态概览：

6992



> 从站选择器显示所选 AS-i 网络中的从站概览。

> 符号颜色表明从站状态。 符合和颜色的含义：
→ ***从站状态：颜色代码 + 符号*** (→ 页 36)

> 文本字段显示所选 AS-i 从站的状态。 可能的状态消息：
- 从站已启用
- 未计划（= 配置错误）
- 双地址（= 双地址错误）
- 外围设备（= 外围设备故障）

使用：

1 选择 AS-i 从站

► 使用箭头键 [▲]、[▶]、[▼] 和 [◀] 来选择所需的 AS-i 从站。

> 焦点（= 橙色框）位于所选 AS-i 从站上。

> 信息栏显示所选 AS-i 从站的地址。

> 文本字段显示有关所选 AS-i 从站的状态消息。

2 激活所选 AS-i 从站

► 使用 功能键 [Select] 来激活所选 AS-i 从站并转到下一个菜单页面。
“或”：
使用 功能键 [Back] 来取消和离开从站选择器。

从站状态：颜色代码 + 符号

11236

单从站	A/B 从站	颜色	含义
		灰色	找不到任何从站： 从站地址既不在 LPS 中，也不在 LDS 中
		绿色	已激活从站（在 LAS 中）
		红色	配置错误类型 1： – 已计划从站（在 LPS 中），但找不到（在 LDS 中）
		黄色	从站以信号报知外围设备故障
		粉红色	多个从站拥有相同地址（双地址错误）
		灰红	配置错误类型 2： – 找到的从站（在 LDS 中）未计划（在 LPS 中） – 找到的从站拥有与已计划从站行规不同的另一个行规

颜色组合的含义（示例：配置错误类型 2）

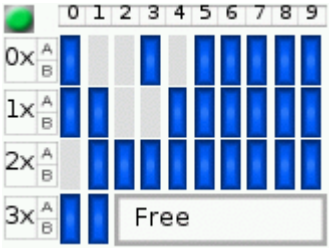
11237

符号	颜色	含义
	灰红 灰色	配置错误类型 2： – 已计划单从站（在 LPS 中），但找不到（在 LDS 中）。 – 相反，已安装地址相同的新 A 从站。
	灰色 灰红	配置错误类型 2： – 已计划单从站（在 LPS 中），但找不到（在 LDS 中）。 – 相反，已安装地址相同的新 B 从站。
	灰红	配置错误类型 2： – 已计划 A 或 B 从站（在 LPS 中），但找不到（在 LDS 中）。 – 相反，已安装地址相同的新单从站。

可用从站地址概览

6993

在此概览中，从站选择则其显示可用和已占用的 AS-i 地址。



> 符号颜色指示 AS-i 地址的状态。 符合和颜色的含义：
→ ***可用从站地址：颜色代码 + 符号*** (→ 页 37)

> 文本字段显示所选 AS-i 从站的状态。 可能的状态消息：
- 可用
- 缺少的从站

使用：

1 选择 AS-i 地址

► 使用箭头键 [▲]、[▶]、[▼] 和 [◀] 来选择所需的 AS-i 地址。

> 焦点（= 橙色框）位于所选 AS-i 地址上。

> 信息栏显示所选 AS-i 地址。

> 文本字段显示所选 AS-i 地址的状态消息。

2 激活所选 AS-i 地址

► 使用 [Select] 功能键 来激活所选 AS-i 地址并转到下一个菜单页面。
"或"：
使用 [Back] 功能键 来取消和离开从站选择器。

可用从站地址：颜色代码 + 符号

11239

单从站	A/B 从站	颜色	含义	优先级
		灰色	从站地址已使用。	--
		青绿色	根据 LDS，地址可用（= 找不到任何从站），但是： 地址已属于已存储计划（= 应用程序行规）。	1
		蓝色	根据 LDS，地址可用（= 找不到任何从站）。 地址未用于已存储计划（= 应用程序行规）。	2

颜色组合的含义

11240

符号	颜色	含义
	蓝色 蓝色	要设定地址的从站为 A/B 从站： A 和 B 地址均是可用的。
	蓝色 灰色	要设定地址的从站为 A/B 从站： – A 地址是可用的。 – B 地址已使用。
	灰色 蓝色	要设定地址的从站为 A/B 从站： – A 地址已使用。 – B 地址是可用的。
	青绿色 青绿色	要设定地址的从站为 A/B 从站： A 和 B 地址均是可用的，但已用于已存储计划。
	青绿色 灰色	要设定地址的从站为 A/B 从站： – A 地址是可用的，但已用于已存储计划。 – B 地址已使用。
	灰色 青绿色	要设定地址的从站为 A/B 从站： – A 地址已使用。 – B 地址是可用的，但已用于已存储计划。
	青绿色 蓝色	要设定地址的从站为 A/B 从站： – A 地址是可用的，但已用于已存储计划。 – B 地址是可用的。
	蓝色 青绿色	要设定地址的从站为 A/B 从站： – A 地址是可用的 – B 地址是可用的，但已用于已存储计划。

确认消息

7033

确认消息是安全提示。 它会在对系统设定执行重要更改时显示。 确认消息显示执行的更改。 若要让更改生效，首先需要由操作员确认此类更改。

示例：

> 操作： 将 AS-i 从站地址从 1a 更改为 1b
> 确认消息显示：
  – 操作 (= 更改 AS-i 地址)
  – 更改前的从站地址
  – 更改后的从站地址
> 操作员有以下输入选项：
  – 功能键 [Select]
  – 功能键 [Back]

使用：

1 更改**设**定

► 更改系统设定。

> 将显示确认消息。

2 **确认**消息

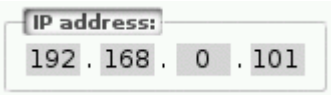
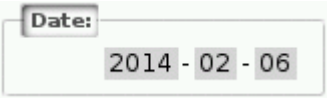
► 使用 功能键 [Select] 来确认更改并应用新值。
"或"：
使用 功能键 [Back] 来拒绝更改并继续使用新值。

> 页面显示有效设定。

数值字段

7046

数值字段让操作员可输入整数值。 值范围视具体情况而定。 数值字段是以下 GUI 元素的一部分：

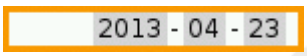
控件元素	示例	含义
[IP address]		[w.x.y.z] 格式的 IP 地址 (IPv4) 条目 – w | x | y | z = 网络段（值范围：0... 255）
[Date]		[yyyy-mm-ss] 格式的日期条目 – yyyy = 年（值范围：0000 ... 9999） – mm = 月（值范围：01 ... 12） – dd = 日（值范围：01 ... 31）
		[hh:mm:ss] 格式的时间条目 – hh = 小时（值范围：00 ... 12） – mm = 分钟（值范围：00 .... 59） – ss = 秒钟（值范围：00 ... 59） 无法编辑秒钟 (ss) 的数值字段！
模拟值		模拟输出值的条目 值范围（每个数值字段）： 0 ... 9

使用（使用数值数据字段的示例）：

1 **选择数值字段**

► 使用 箭头键 [▲]/[▼] 来选择日期控件元素。

> 焦点（= 橙色框）位于所选日期控件元素上。



> 日期控件元素显示当前日期

2 **激活编辑模式**

► 按 功能键 [Select] 以进入编辑模式。

> 焦点（橙色框）位于右侧元素上。

3 **设定所需值**

► 使用 箭头键 [▲]/[▼] 来递增所需的值。

> 区段显示新值。

按住箭头键 [▲]/[▼] 不放，以快速在更大的值范围内变化。

4 **选择**下一个区段

► 使用箭头键 [◀]/[▶] 来标记要编辑的区段。

> 焦点（橙色框）移至标记的区段

► 可选： 重复步骤 3 和 4，直至所有区段均有所需的值。

5 采用**设定值**

► 使用 [Select] 功能键 来确认设定值和离开编辑模式。

"或"：

使用 [Back] 功能键 来复位设定值和离开编辑模式。

> 日期控件元素显示有效日期

设定值不会始终立即生效。 通常必须通过单击按钮（例如 [Accept selection]）来确认更改！

二进制字段

7047

二进制字段让操作员能按位更改数字值。

示例：

> 4 位数字值的显示：
  - 二进制表示法
    = 位已开启 (= 1)。
    = 位已关闭 (= 0)。
  - 十六进制表示法：
    0xf = 1111

使用：

1 选择二进制字段

► 使用 [▲] / [▼] 箭头键 来选择二进制字段。

> 焦点（橙色框）位于所选二进制字段上。

> 控件元素显示当前值（数字和十六进制）。

2 激活编辑模式

► 按 [Select] 功能键 以进入编辑模式。

> 焦点（橙色框）位于右侧元素上。

3 设定所需值

► 使用 [▲] / [▼] 箭头键 来设定所需的值。

> 控件元素显示数字和十六进制格式的新值。

4 选择下一个区段

► 使用 [◀] / [▶] 箭头键 来标记要编辑的区段。

> 焦点（橙色框）位于所选区段上。

► 可选： 重复步骤 3 和 4，直至所有区段均有所需的值。

5 应用设定值

► 使用 [Select] 功能键 来确认设定值和离开编辑模式。
“或”：
使用 [Back] 功能键 来复位设定值和离开编辑模式。

> 二进制字段显示当前值（二进制和十六进制）。

4.4 远程访问

内容

7068

装置拥有集成式 Web 服务器。 它可生成可供通过 Web 浏览器远程访问所有装置功能的 Web 界面。Web 界面让操作员可通过基于以太网的网络，在永久性操作中，轻松对装置执行配置、参数设定和监控。

4.4.1 概要

7069

Web 界面的操作理念遵循与本地显示屏操作理念相同的原则。 Web 界面使用与本地显示屏的图形用户界面相同的菜单项目、菜单结构和符号。

其他功能

14180

与显示屏的用户界面相比，Web 界面提供以下额外功能：

- 下载装置描述文件（GSDML 文件）
  （→ **下载 GSDML 文件** (→ 页 113)）
- 采用电脑/便携电脑的日期和时间
  （→ ***采用电脑的系统时间：*** (→ 页 98)）
- 保存诊断协议
  (→ ***存储诊断协议*** (→ 页 102))
- 使用 IFM 系统解决方案
  (→ ***IFM 系统解决方案*** (→ 页 115))

4.4.2 推荐的浏览器

7070

使用以下任一互联网浏览器来正确显示 Web 界面的 HTML 页面：

- Microsoft Internet Explorer（从 8.0 版本起）
- Mozilla Firefox（从 3.5 版本起）

4.4.3 操作说明

1758

Web 界面：访问

10283

► 电脑/便携电脑/移动装置： 启动互联网浏览器。

► 互联网浏览器： 在地址行中输入装置的 IP 地址（例如 192.168.82.2）

> 互联网浏览器显示 Web 界面的起始页。

Web 界面：导航

14193

在 Web 界面中，使用指针装置（例如鼠标，触摸板），而非以下按键功能：

- 箭头键 [▼]、[▲]、[▶]、[◀] 的导航功能
- 选择功能键 [Select] 和 [Select] 的功能 [Back]

示例：

若要选择  >  :

► 将鼠标置于主导航栏中的 [AS-i 1] 符号 上。

> [AS-i 1] 符号 为焦点所在处。

> 子导航栏显示。

> 导航轨迹显示在菜单树中的实际位置： AS-i 1

► 将鼠标置于子导航栏中的 [Diagnosis] 符号 上。

> [Diagnosis] 符号 为焦点所在处。

> 导航轨迹显示在菜单树中的实际位置： AS-i 1 > 诊断

► 单击 [Diagnosis] 符号

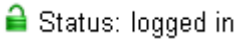
> Web 浏览器显示菜单页面 [Diagnosis]

Web 界面：密码保护

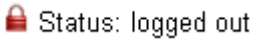
14187

Web 服务器拥有基本密码保护功能，可防止通过 Web 界面意外或未经授权地更改装置设定。

访问 Web 界面时，顶部的状态栏将显示用户是已登录还是已注销：



用户已登录：
- 对装置设定的完全访问权限
- 对诊断和信息数据的完全访问权限



用户已注销：
- 对装置设定无访问权限
- 对诊断和信息数据的访问权限

密码为： CAFE

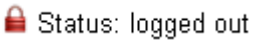
无法禁用密码保护！

无法更改密码！

Web 界面登录

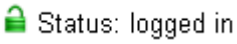
14221

► 转到 Web 界面 (→ ***操作说明*** (→ 页 45)) 。

> 在 Web 界面顶部的状态栏显示以下状态消息：


► 在 [Password:] 字段中输入固定密码。

► 单击 [Login] 以登录 Web 界面。

> 状态栏显示更改的状态：


> 操作员拥有对 Web 界面所有菜单和功能的无限制访问权限。

如果执行以下任一操作，则操作员将保持为已登录状态：

- 关闭并重新打开 Web 浏览器
- 重新启动电脑/便携电脑
- 重新启动 AC140n

若要防止对装置设定未经授权的访问：

► 在您离开 Web 界面前手动注销！ (→ **与 Web 界面断开连接** (→ 页 48))

► 访问 Web 界面前，谨记关闭 Web 浏览器的“保存密码”功能！

► 如果未关闭 Web 浏览器的“保存密码”功能：请在浏览器设定中删除保存的密码！

与 Web 界面断开连接

14276

若要从 Web 界面注销：

► 启动 Web 界面

> Web 界面顶部显示带有状态消息的状态行：

Status: logged in

► 通过单击 [Logout] 从 Web 界面注销

> 状态栏显示更改的状态

Status: logged out

> 用户仅可在 Web 界面中访问包含诊断和信息数据的菜单。

> 用户在 Web 界面中访问带有装置设定的菜单时，将显示错误消息。

即使在 Web 界面关闭，然后重新启动时，用户也会保持为已登录 Web 界面的状态。

若要防止对装置设定未经授权的访问：

► 请在通过 Web 浏览器完成访问后，从装置 Web 界面中手动注销！

► 未禁用 Web 浏览器的密码记忆功能时： 在浏览器设定中删除所有保存的密码！

5 菜单

内容

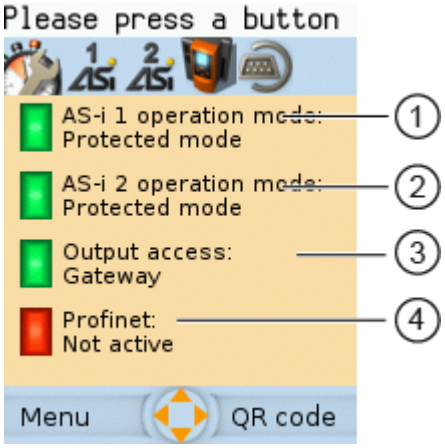
18788

此章节描述装置图形用户界面的菜单功能。

5.1 开始屏幕

14439

启动设备时，图形用户界面的开始屏幕将显示（特殊情况： 初始调试或固件更新后启动系统： → **开始屏幕"基本设定"** (→ 页 125)). 开始屏幕显示重要系统组件的状态信息。 此外，从开始屏幕访问和操作图形用户界面。



① AS-i 主站 1 工作模式
- = 保护模式
- = 计划模式

② AS-i 主站 2 工作模式
→ AS-i 主站 1 工作模式
only available for devices with 2 AS-i masters

③ AS-i 从站输出功能的控制实例
- = 手动 | 手动 - 通过 PLC
- = 网关 | 网关 – 通过 PLC
- = PLC

④ Profinet 连接的状态
- = 活动
- = 非活动

► 按下 [Menu] 功能键以转至菜单 (→ **快速设定** (→ 页 51))

OR:

► 按下 [OSC] 功能键以转至在线支持中心 (→ **在线支持中心 (OSC)** (→ 页 141))

5.2 快速设定

7727

[快速设定] 菜单提供最重要设备功能的快速访问方式。

导航路径	功能
	→ **快速设定：计划 AS-i 网络** (→ 页 52) → **快速设定： 配置 AS-i 主站的工作模式** (→ 页 53) → **快速设定： 配置输出功能访问权限** (→ 页 54) → ***快速设定： 通过 QR 代码访问装置*** (→ 页 55) → **快速设定： 配置 Profinet 接口** (→ 页 56) → **快速设定： 设定配置接口** (→ 页 57) → **快速设定：为已连接至 AS-i 主站 1 的 AS-i 从站设定地址** (→ 页 59) → **快速设定：为已连接至 AS-i 主站 2 的 AS-i 从站设定地址** (→ 页 61)

5.2.1 快速设定：计划 AS-i 网络

2761

在计划调整期间，AS-i 从站执行以下操作：

- 保存所有检测到的 AS-i 从站 (LDS) 的配置数据
- 将检测到的 AS-i 从站添加至已计划从站 (LPS) 的列表中

若要在 AS-i 主站 1 和/或 AS-i 主站 2 上执行计划调整：

1 选择菜单页面

► 

► 选择 [Project all] 选项卡。

2 为计划调整选择 AS-i 主站

► 按需要设定以下参数：

参数	含义	可能的值	
		☐	从计划调整中排除 AS-i 主站 1
		☑	将 AS-i 主站 1 加入计划调整中
		☐	从计划调整中排除 AS-i 主站 2
		☑	将 AS-i 主站 2 加入计划调整中

3 开始计划调整

► 按下 [Start projection process]。

> 所选 AS-i 主站进入“计划模式”。

> 在所选 AS-i 主站上执行计划调整。

> 计划调整完成后，所选 AS-i 主站进入“保护模式”。

5.2.2 快速设定： 配置 AS-i 主站的工作模式

2767

有关 AS-i 主站工作模式的信息：→ ***Operating* modes of the *AS-i master*** (→ 页 153)

若要配置 AS-i 主站的工作模式：

1 选择菜单页面

► 

► 选择 [Operation modes] 选项卡。

2 配置 AS-i 主站 1 的工作模式和已连接 AS-i 从站的运行状况

> 在 组别 [AS-i master 1] 中，按需要设定以下参数：

参数	含义	可能的值	
		☐	计划模式未启用： AS-i 网络在保护模式（正常模式）下运行
		☑	计划模式已启用： 可以计划 AS-i 网络。 （→ ***快速设定：为已连接至 AS-i 主站 1 的 AS-i 从站设定地址*** (→ 页 59)或→ ***快速设定：为已连接至 AS-i 主站 2 的 AS-i 从站设定地址*** (→ 页 61)）
		☐	更改工作模式时，将复位从站： 更改工作模式时，将短时间复位 AS-i 从站（复位或离线阶段）。
		☑	更改工作模式时，不会复位从站： 更改工作模式时，AS-i 从站无中断地继续运作。

> 已应用所选值。

3 可选：设定 AS-i 主站 2 的工作模式以及 AS-i 从站的运行状况

► 为 [AS-i master 2] 组重复步骤 2。

5.2.3 快速设定： 配置输出功能访问权限

2812

一次仅有一个控制实例能拥有对已连接 AS-i 从站输出功能的写入访问权限。 操作员使用参数 [Output access] 来配置控制实例。

若要配置 AS-i 从站输出的控制实例：

1 选择菜单页面

► 

► 选择 [Operation modes] 选项卡。

2 为 AS-i 从站的输出功能设定控制实例

► 从列表 [Output access] 中，选择所需的值：

参数	含义	可能的值	
		Gateway	更高级别的 PLC 控制 AS-i 从站的输出功能。
		Manual	操作员通过图形用户界面控制 AS-i 从站的输出。
		PLC	装置内部 PLC 控制 AS-i 从站的输出功能。

3 保存更改

► 按下 [Accept selection] 以保存更改。

> 所选实例控制 AS-i 从站的输出功能。

5.2.4 快速设定： 通过 QR 代码访问装置

2818

QR 代码 (快速反应代码 (**Q**uick **R**esponse Code)) 让操作员可从智能手机或平板电脑访问装置的 Web 界面。

要求：

- AS-i 装置必须连接至带有开关功能的无线 LAN 路由器。
  (→ ***Connection via Ethernet network*** (→ 页 151))
- 智能手机/平板电脑已连接至无线 LAN 路由器。
- 智能手机/平板电脑提供摄像头功能。
- 智能手机/平板电脑已安装 QR 代码读取器。

1 选择菜单页面

► 

► 选择 [QR-Code] 选项卡。

> 显示屏显示 QR 代码。

2 读取 QR 代码

► 启动 QR 代码读取应用程序并扫描 QR 代码。

> 智能手机显示装置的 Web 界面 (→***远程访问*** (→ 页 43)) 。

5.2.5 快速设定： 配置 Profinet 接口

2820

若要配置 Profinet 接口：

1 选择菜单页面

► 

► 选择 [Profinet] 选项卡

2 设定 Profinet 接口的 IP 参数

> 按需要设定以下参数：

参数	含义	可能的值
[IP address]	Profinet 接口的 IP 地址	例如 192.168.10.3
[Subnet mask]	Profinet 网络段的网络掩码	例如 255.255.255.0
[Gateway address]	Profinet 网关的 IP 地址	例如 192.169.10.1

3 保存更改

► 使用 [Accept] 来保存更改。

► 已应用所选值。

> Profinet 接口可通过设定地址来访问。

5.2.6 快速设定： 设定配置接口

2868

装置提供以下选项，用于配置 EtherNet 配置接口：

手动 = 操作员手动设定接口参数（IP 地址、网络掩码、网关地址）。

- 自动 = 自动设定接口参数。 操作员可在这些协议之间选择：
  – 动态主机配置协议 (DHCP)
  – 零配置网络 (Zeroconf)

装置必须连接至 DHCP 服务器，以通过 DHCP 自动接收接口参数。

► 将配置接口 (X3) 连接至 DHCP 服务器。

若要配置配置接口的 IP 参数：

1 选择菜单页面

► 

► 选择 [Configuration interface] 选项卡。

2 显示已启用设定

> 以下参数显示已启用设定：

参数	含义	可能的值	
		☐	通过操作员执行的接口参数手动指定
		☑	接口参数的自动指定
		Static	操作员手动设定 IP 参数。
		DHCP	IP 参数通过 DHCP 服务器设定。
		Zeroconf	IP 参数使用 Zeroconf 协议自动设定。
[IP address]	接口的 IP 地址	例如 192.168.0.100	
[Subnet mask]	网络段的网络掩码	例如 255.255.255.0	
[Gateway address]	网络网关的 IP 地址	例如 192.168.0.1	

采取以下任一措施：
– 手动配置 IP 参数：继续执行 → 步骤 3
– 手动配置 IP 参数：继续执行 → 步骤 4

3 手动配置 IP 参数

► 取消选中 [Optain IP address autom.]。

► 按需要设定以下参数：
– [IP address]
– [Subnet mask]
– [Gateway address]

► 按下 [Accept] 以保存更改。

► 继续执行 → 步骤 5

4 自动配置 IP 参数

► 选中 [Optain IP address autom.]。

► 按下 [Accept] 以保存更改。

> 装置尝试从 DHCP 服务器获取 IP 参数。

> 如果通过 DHCP 服务器配置 IP 参数失败，则装置会通过 Zeroconf 协议生成 IP 参数。

接口的自动配置需要约 10 秒钟的时间。

5 显示当前设定

> 参数（→ 步骤 2）显示配置接口的已启用 IP 设定。

5.2.7 快速设定：为已连接至 AS-i 主站 1 的 AS-i 从站设定地址

2774

若要更改已连接至 AS-i 主站 1 的 AS-i 从站之地址：

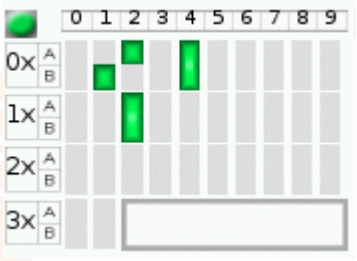
1 选择菜单页面

► 

► 选择 [Addressing AS-i 1] 选项卡。

2 选择 AS-i 从站

> 该页面将提供所选 AS-i 主站上 AS-i 从站的当前地址设定和状态之概览（→ 图解）
> 有关颜色代码的注意事项：→ ***从站状态概览：***(→ 页 35)

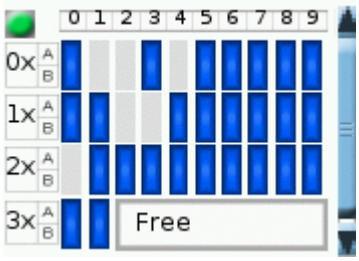


► 选择要更改其地址的 AS-i 从站。

► 使用 [Select] 来激活所选 AS-i 从站。

3 选择新 AS-i 地址

> 该页面提供可用 AS-i 地址的概览（→ 图解）
> 有关颜色代码的注意事项：→ ***可用从站地址概览*** (→ 页 37)



► 选择要为 AS-i 从站指定的地址。

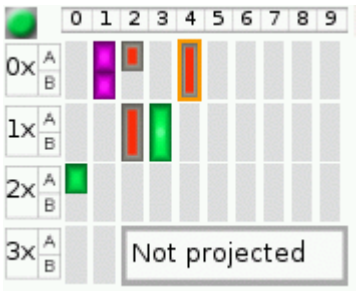
► 使用 [Select] 指定所选地址。

> 确认提示将显示。

► 使用 [OK] 确认消息。

> AS-i 从站拥有新地址。

> 该页面提供当前地址设定和配置错误的概览（→ 图解）



4 为额外的 AS-i 从站设定地址（可选）

► 重复步骤 2 和 3 来为额外的 AS-i 从站设定地址。

更改地址后，现有配置与已存储配置不再相符。

> 从站状态指示配置错误。

若要排除配置错误：

► 开始计划调整（→ ***快速设定：计划 AS-i 网络*** (→ 页 52)）。

5.2.8 快速设定：为已连接至 AS-i 主站 2 的 AS-i 从站设定地址

11671

若要更改已连接至 AS-i 主站 2 的 AS-i 从站之地址

1 选择菜单页面

► 

► 选择 [Addressing AS-i 2] 选项卡。

2 更改 AS-i 从站地址

为已连接至 AS-i 主站 2 的 AS-i 从站设定地址的程序与为已连接至 AS-i 主站 1 的 AS-i 从站设定地址的程序相同 (→ ***快速设定：为已连接至 AS-i 主站 1 的 AS-i 从站设定地址*** (→ 页 59)) 。

5.3 AS-i 1 / AS-i 2

7780

[AS-i 1] 和 [AS-i 2] 菜单提供对 AS-i 网络配置功能的访问权限。

[AS-i 2] 菜单仅可用于带有两个 AS-i 主站的设备！

导航路径	内容
1 >  2 > 	AS-i 主站设定 → **设定 AS-i 主站的工作模式** (→ 页 63) → **执行计划调整** (→ 页 64) → **设定 AS-i 主站的监控功能** (→ 页 65)
1 >  2 > 	AS-i 网络诊断 → **显示和复位错误计数器** (→ 页 66) → **显示 AS-i 从站的错误统计数据** (→ 页 67) → **显示电源电压分析** (→ 页 68) → **显示和复位性能数据** (→ 页 69)
1 >  2 > 	AS-i 从站设定 → **显示 AS-i 从站的输入/输出数据** (→ 页 70) → **手动更改数字输出值** (→ 页 73) → **手动更改模拟输出值** (→ 页 74) → **显示 AS-i 从站信息** (→ 页 75) → **更改 AS-i 从站地址** (→ 页 76) → **更改 AS-i 从站参数输出** (→ 页 77) → **更改 AS-i 从站的扩展 ID1** (→ 页 77)

5.3.1 AS-i 1/AS-i 2： 主站设定

8996

菜单项目 [Master setup] 提供对所选 AS-i 主站配置选项的访问权限。

设定 AS-i 主站的工作模式

7783

有关 AS-i 主站的工作模式的更多信息： → ***Operating* modes of the *AS-i master*** (→ 页 153)

若要设定 AS-i 主站的工作模式：

1 **选择菜单页面**

►  >  或  > 

2 **设定 AS-i 主站 1 的工作模式和已连接 AS-i 从站的运行状况**

> 按需要设定以下参数：

参数	含义	可能的值	
		☐	计划模式未启用： AS-i 网络在保护模式（正常模式）下运作
		☑	计划模式已启用： 可以计划 AS-i 网络。
		☐	更改工作模式时，将复位从站： 更改工作模式时，将短时间复位 AS-i 从站（复位或离线阶段）。
		☑	更改工作模式时，不会复位从站： 更改工作模式时，AS-i 从站无中断地继续运作。

> 已应用所选值。

执行计划调整

7785

在计划调整期间，AS-i 主站 将当前在 AS-i 网络中找到的所有 AS-i 从站的配置存储于其存储器中，并为其各指定一个有效的 AS-i 地址。

计划调整仅可在计划模式下执行：

► 必须选中 [Projection mode] (→***设定 AS-i 主站的工作模式*** (→ 页 63)) 。

若要启动计划调整：

1 **选择菜单页面**

►  >  或  > 

2 **执行计划调整**

► 按下 [Start projection process] 按钮。

> 将执行计划调整。

如果成功：

> AS-i 主站上的所有从站均已计划。

如果没有成功：

> 联机支持中心将显示错误消息。

► 排除错误并重复该过程。

设定 AS-i 主站的监控功能

7788

若要设定所选 AS-i 主站的监控功能：

1 **选择菜单页面**

►  >  或  > 

2 **设定 AS-i 主站的监控功能**

► 按需要设定以下参数：

参数	含义	可能的值	
		☐	已禁用自动设定地址
		☑	已启用自动设定地址
		☐	不检测 AS-i 系统中的接地故障
		☑	检测 AS-i 系统中的接地故障
		☐	不检测地址相同的 AS-i 从站
		☑	检测地址相同的 AS-i 从站

> 已应用所选值。

5.3.2 AS-i 1/AS-i 2： 诊断

7864

[Diagnosis] 菜单提供对所选 AS-i 网络诊断数据的访问权限。

显示和复位错误计数器

7796

若要显示和复位 AS-i 错误计数器：

1 **选择菜单页面**

►  >  或  > 

► 选择 [Error counters] 选项卡。

2 **显示错误计数器**

> 页面显示以下信息：

标记	含义
Telegrams	发生的消息错误数目
Configuration	发生的配置错误数目
Voltage < 22,5V	< 22.5 V 的电压错误数目
Voltage < 19,0V	< 19.0 V 的电压错误数目
Earth fault	检测到的接地故障数目

3 **可选：复位错误计数器**

► 按下 [Reset] 按钮。

> 所有错误计数器将复位至 0。

显示 AS-i 从站的错误统计数据

7804

若要显示所选 AS-i 主站上 AS-i 从站的错误消息：

1 选择菜单页面

►  >  或  > 

► 选择 [Errors / slave] 选项卡。

2 显示 AS-i 从站的错误统计数据

> 页面显示以下信息：

列标题	含义
Address	AS-i 从站的地址
S/A	此地址的单从站或 A 从站之错误数目
B	此地址的 B 从站之错误数目

► 使用 [▲] / [▼] 来滚动该表。

显示电压供应器分析

7808

若要显示电压供应器分析：

1 **选择菜单页面**

►  >  或  > 

► 选择 [Power supply] 选项卡。

2 **显示电压供应器分析**

> 页面显示以下信息：

标记	含义	可能的值	
		24V	电压通过 AS-i 网络和 24 V 辅助设备单独供应。
		AS-i	电压仅通过 AS-i 网络供应。
		Power24	电压通过数据解耦模块供应。
AS-i Voltage	测得的 AS-i 电压（以 [V] 为单位）	例如 30.3 V	
			AS-i 网络是对称的
			AS-i 网络是不对称的
			AS-i 网络有接地故障
		网络对称性的图表表示法： 	

显示和复位性能数据

7816

若要显示所选 AS-i 主站的性能统计数据：

1 选择菜单页面

►  >  或  > 

► 选择 [Performance] 选项卡。

2 显示性能数据

> 页面显示以下信息：

标记	含义
Activated slaves	AS-i 网络上活动 AS-i 从站的数目
AS-i cycle time [ms] ▪ minimum ▪ maximum ▪ current	AS-i 周期时间（以 [ms] 为单位的值） 最短周期时间 最长周期时间 当前周期时间

3 可选：复位性能数据

► 按下 [Reset] 按钮。

> 将删除最短和最长周期时间的已保存统计数据。

5.3.3 AS-i 1/AS-i 2： AS-i 从站

9037

[AS-i Slaves] 菜单提供对 AS-i 从站信息和配置选项的访问权限。

显示的配置选项范围（[Data] 和 [Setup] 选项卡）因所选 AS-i 从站的状态而异。

显示 AS-i 从站的输入/输出数据

7826

若要显示所选显示 AS-i 从站的输入/输出数据或参数输出：

1 **选择菜单页面**

►  >  或  > 

► 选择 AS-i 从站（→**从站选择器** (→ 页 34)）。

► 选择 [Data] 选项卡。

2 **显示输入/输出数据**

> 视所选 AS-i 从站的行规而定，页面将显示以下数据：

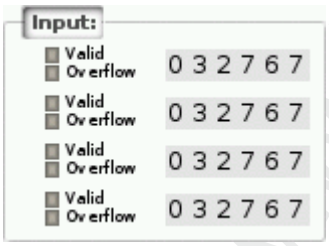
数字输入

7867

标记	含义	示例/可能的值	
			
			数据位已关闭（0/“关闭”）
			数据位已开启（1/“开启”）

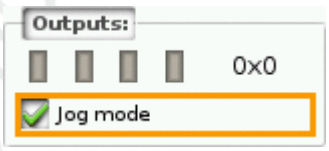
模拟输入

7870

标记	含义	示例/可能的值	
[Inputs]	模拟输入通道的当前值以及其状态的相关信息		
			无效值
			有效值
			值在有效值范围内
			已超过有效值范围

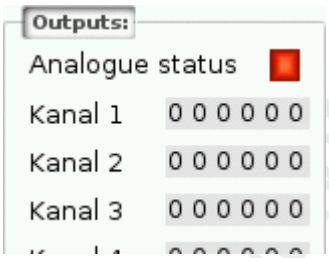
数字输出

7837

标记	含义	示例/可能的值	
			
			数据位已关闭（0/“关闭”）
			数据位已开启（1/“开启”）
			作业模式已禁用（“开关模式”） > 在您退出编辑模式前，更改不会影响输出功能。
			作业模式已启用（“瞬时开关模式”） > 更改将立即影响输出功能。

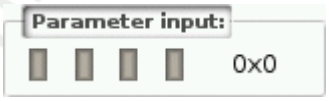
模拟输出

7876

标记	含义	示例/可能的值
[Outputs]	模拟输出通道的当前值以及其状态的相关信息	
		不正常
		正常
▪ [Channel x]	模拟输出通道 x 的当前值 （x = 1...n；n = 每个 AS-i 从站的通道数目）	每位数： 0 ... 9

参数输入

7881

标记	含义	示例/可能的值
		
		数据位已关闭（0/“关闭”）
		数据位已开启（1/“开启”）

手动更改数字输出值

7830

⚠ 警告

人身伤害的风险！ 机器/设备材料损坏的风险！

操作员应对手动更改数字输出值所造成的任何后果负责！

- ► 保护相关区域。
- ► 仅允许经过培训的人员手动设定输出功能。

如果禁用作业模式：
更改从站输出后，输出值将保持为已更改的值。

- ► 测试结束后，立即重新将已反转输出更改为原始值！

若要手动更改 AS-i 从站的数字输出值：

1 启用**对输**出功能的手**动访问权**限

- ► 设定参数 [Output access] = 手动 (→**设定输出访问权限** (→ 页 89)) 。

2 **选择**菜**单页**面

- ►  >  或  > 
- ► 选择 AS-i 从站 (→**从站选择器** (→ 页 34)) 。
- ► 选择 [Data] 选项卡。

3 手**动设**定数字**输**出**值**

- > [Outputs] 组显示数字输出的当前值 (二进制和十六进制表示法) 。
- ► [Jog mode] 应按需要设定。 (→***数字输出*** (→ 页 71))
- ► 逐位更改所需的输出值。
- > 已应用所选值。

手动更改模拟输出值

7840

若要手动更改 AS-i 从站的模拟输出值：

1 启用**对输**出功能的手**动访问权**限

► 参数 [Output access] = 设至手动 (→**设定输出访问权限** (→ 页 89)) 。

2 **选择**菜**单页**面

►  >  或  > 

► 选择 AS-i 从站 (→**从站选择器** (→ 页 34)) 。

► 选择 [Data] 选项卡。

3 手**动设**定模**拟输**出**值**

> [Outputs] 组显示模拟输出的当前值。

► 以一次一位数的方式更改所需通道的值 (→**数值字段** (→ 页 40)) 。

> 已应用所选值。

► 可选：重复步骤 3 以更改其他通道。

显示 AS-i 从站信息

10935

若要显示 AS-i 从站的相关信息：

1 选择菜单页面

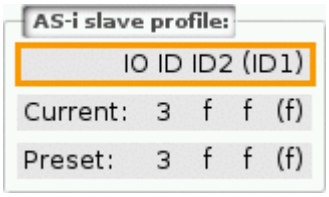
►  >  或  > 

► 选择 AS-i 从站 (→**从站选择器** (→ 页 34)) 。

► 选择 [Information] 选项卡。

2 显示 AS-i 从站的相关信息

> 页面显示以下信息：

标记	含义	可能的值	
[AS-i Slave address]	AS-i 从站的当前地址	例如 13B	
			AS-i 从站已启用
			缺少 AS-i 从站
			未计划
			双地址错误
			外围设备故障
[AS-i slave profile]	十六进制格式的当前 (= 当前) 和预期的 (= 预设) 从站行规 (IO、ID、ID2、ID1)		

► 将 [▲] / [▼] 用于页面导航。

更改 AS-i 从站地址

7851

若要更改 AS-i 从站的地址：

1 选择菜单页面

►  >  或  > 

► 选择 AS-i 从站 (→**从站选择器** (→ 页 34)) 。

► 选择 [Setup] 选项卡。

2 更改 AS-i 从站的地址

► 按下 [Change slave address] 按钮。

> 页面显示可用 AS-i 地址概览 (→***可用从站地址概览*** (→ 页 37))

► 选择要为 AS-i 从站指定的地址并用 [Select] 功能键 确认。

> 将显示安全提示。

► 按下 [OK] 以确认安全提示。

> AS-i 从站将拥有新地址。

> 页面显示 AS-i 从站状态概览 (→***从站状态概览：*** (→ 页 35)) 。

3 可选：更改其他 AS-i 地址。

► 重复步骤 2 以更改其他 AS-i 从站地址。

更改地址后，现有配置 (LDS) 与已存储配置 (LPS) 不再相符。

> OSC 显示配置错误。

若要排除配置错误：

► 开始计划调整 (→ ***执行计划调整*** (→ 页 64)) 。

更改 AS-i 从站参数输出

7855

若要更改 AS-i 从站的参数输出：

1 启用**对输**出功能的手**动访问权**限

► 设定 [Output access] = 手动 (→**设定输出访问权限** (→ 页 89))

2 **选择**菜**单页**面

►  >  或  > 

► 选择 AS-i 从站 (→**从站选择器** (→ 页 34)) 。

► 选择 [Setup] 选项卡。

3 更改 **AS-i** 从站的参数**输**出

> [Parameter output] 组显示参数输出的当前指定情况 (二进制和十六进制表示法) 。

► 以一次一个位置的方式调整所需的输出值。

> 已应用所选值。

更改 AS-i 从站的扩展 ID1

10952

若要设定 AS-i 从站的扩展 ID1：

1 **选择**菜**单页**面

►  >  或  > 

► 选择 AS-i 从站 (→**从站选择器** (→ 页 34)) 。

► 选择 [Setup] 选项卡。

2 **设**定**扩**展 **ID1**

> 列表 [ID1] 显示当前的扩展 ID1 值 (十六进制格式) 。

► 从列表 [ID1] 中为扩展 ID1 选择所需的值。

> 已应用所选值。

更改扩展 ID1 后，现有配置与已存储配置不再相符：

> 显示错误消息 (配置错误) 。

► 开始计划调整 (→***执行计划调整*** (→ 页 64)) 。

5.4 系统

7885

[系统] 菜单可供访问允许配置系统和设备内部 PLC 的功能。

导航路径	功能
	设备内部 PLC → **系统：可编程逻辑控制器 (PLC)** (→ 页 79)
	系统信息 → **显示版本信息** (→ 页 88)
	系统设定 → **设定输出访问权限** (→ 页 89) → **启用/禁用设备内部 PLC** (→ 页 90) → **设定装置周期** (→ 页 91) → **切换菜单语言** (→ 页 92) → **设定显示屏的运行状况** (→ 页 94) → **手动设定系统时间** (→ 页 96) → **将系统时间与 NTP 服务器同步** (→ 页 97) → **采用电脑的系统时间：** (→ 页 98) → **保存装置配置** (→ 页 99) → **恢复设备配置** (→ 页 100) → **系统复位** (→ 页 101) → **存储诊断协议** (→ 页 102)
	系统诊断 → **显示诊断数据** (→ 页 103)

5.4.1 系统：可编程逻辑控制器 (PLC)

8955

[PLC] 菜单提供对装置内部 PLC 的访问权限。

导航路径	功能
	PLC 信息： →***显示 CODESYS PLC 的状态*** (→ 页 80) →***显示 PLC 项目的相关信息*** (→ 页 81)
	PLC 设定 →***控制单个 PLC 应用程序*** (→ 页 82) →***控制 PLC 应用程序*** (→ 页 84) →***显示目标可视化*** (→ 页 86)
	PLC 诊断 →**显示已用内存** (→ 页 87)

如需使用 CODESYS 执行装置内部 PLC 的编程之相关信息，请参阅编程手册：
→ www.ifm.com > 选择国家 > [技术资料查询] > (货号) > [操作使用说明书]

PLC：信息

7972

[Information] 菜单项目提供对 PLC 状态和项目信息的访问权限。

显示 CODESYS PLC 的状态

14841

若要显示装置内部 PLC 当前状态的相关信息：

1 选择菜单页面

►  >  > 

► 选择 [Status] 选项卡。

2 显示 CODESYS PLC 的状态

> 页面显示以下信息：

标记	含义	可能的值	
			CODESYS PLC 已禁用。
			CODESYS PLC 已启用。
[Version]	CODESYS 版本	例如 3.5.3.60	
[Node name]	CODESYS 项目中的装置名称	例如	

显示 PLC 项目的相关信息

14842

若要获取装置内部 PLC 上所存储 CODESYS 项目的相关信息：

1 **选择菜单页面**

►  >  > 

► 选择 [Project] 选项卡。

2 **显示 PLC 项目的相关信息**

> 页面显示以下信息：

标记	含义
[Project]	CODESYS 项目文件的名称
[Title]	CODESYS 项目的名称
[Version]	CODESYS 项目的版本号
[Author]	CODESYS 项目的作者

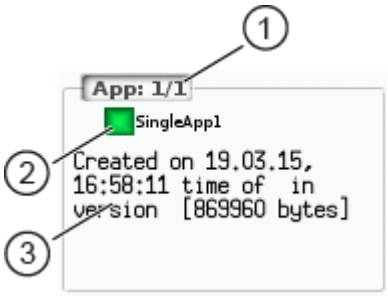
PLC：设定

16217

[Settings] 菜单项目提供对装置上 PLC 应用程序 (app) 的访问权限。

控制单个 PLC 应用程序

14846



① [App x/y]
- x ... 显示的应用程序数目
- y ... 存储的应用程序总数

② 应用程序的状态和名称
- = 已停止应用程序
- = 已启动应用程序

③ 有关应用程序的信息
- 创建的日期和时间
- 作者
- 应用程序版本
- 大小

若要控制装置上存储的单个 PLC 应用程序：

1 **选择菜单页面**

►  >  > 

► 选择 [Applications] 选项卡。

2 **选择应用程序**

► 使用 [▼] 来选择消息字段。

> 焦点（橙色框）位于消息字段上。

► 使用 [▼] / [▲] 来选择所需的应用程序。

► 执行以下任一操作：
- 启动单个 PLC 应用程序：继续执行 → 步骤 3
- 停止单个 PLC 应用程序：继续执行 → 步骤 4

3 **启动单个 PLC 应用程序**

► 按 [Start] 以启动所选 PLC 应用程序。

> 确认提示将显示。

► 按下 [OK] 以确认提示。

> 将启动 PLC 应用程序。

► 继续执行 → 步骤 5

4 停止单个 PLC 应用程序

► 按 [Stop] 以停止所选应用程序。

> 确认提示将显示。

► 按下 [OK] 以确认提示。

> 将停止应用程序。

5 显示 PLC 应用程序的相关信息

> 将更新 PLC 应用程序的状态显示

控制 PLC 应用程序

14847

若要控制装置上存储的所有 PLC 应用程序：

1 **选择菜单页面**

►  >  > 

► 选择 [All applications] 选项卡。

2 **显示有关 PLC 应用程序的状态信息**

> 页面显示以下信息：

标记	含义
[Total]	装置上存储的应用程序数目
[Started]	正在运行的应用程序数目

► 执行以下任一操作：
- 启动所有 PLC 应用程序：继续执行 → 步骤 3
- 停止所有 PLC 应用程序：继续执行 → 步骤 4
- 重置所有 PLC 应用程序：继续执行 → 步骤 5

3 **启动所有 PLC 应用程序**

► 按下 [Start] 按钮。

> 确认提示将显示。

► 按下 [OK] 以确认提示。

> 将启动所有 PLC 应用程序。

► 继续执行 → 步骤 6

4 **停止所有 PLC 应用程序**

► 按下 [Stop] 按钮。

> 确认提示将显示

► 按下 [OK] 以确认提示。

> 将停止所有 PLC 应用程序。

► 继续执行 → 步骤 6

5 **重置所有 PLC 应用程序**

► 按下 [Reset] 按钮。

> 确认提示将显示。

► 按下 [OK] 以确认提示。

> 将重置和停止所有 PLC 应用程序。

6 显示 PLC 应用程序的状态

> 页面显示有关已存储 PLC 应用程序的更新信息。

> 将更新 [Start]、[Stop] 和 [Reset] 按钮的状态。

显示目标可视化

9055

使用 CODESYS 编程系统，用户能以可选方式为目标可视化编程，以创建特定应用程序用户界面来显示 AC140n。 目标可视化随 CODESYS 项目一起加载至装置上，但必须予以手动激活。

如果装置上未存储任何有效的目标可视化，则激活 [Activate Target-Visu] 按钮后会显示绿色屏幕。

若要退出目标可视化并返回菜单页面：

► 同时按下 [◀] 和 [▶]。

如果输入 [◀] + [▶] 后装置无反应，则表示已禁用该组合键。

► 使用系统命令“显示目标可视化”（→ ***Command 0x0110 – Display target visualisation*** (→ 页 239)）来激活该组合键！

若要激活目标可视化：

1 **选择菜单页面**

►  >  > 

► 选择 [Activate TargetVisu] 选项卡。

2 **启动目标可视化**

► 按下 [Activate Target-Visu] 按钮。

> 将显示确认消息。

► 按 [OK] 按钮以确认消息。

> 显示屏显示目标可视化。

PLC：诊断

10936

[Diagnosis] 菜单项目提供对装置内部 PLC 诊断数据的访问权限。

显示已用内存

14845

若要显示当前已用内容容量的相关信息：

1 **选择菜单页面**

►  >  > 

► 选择 [Memory] 选项卡。

2 **显示已用内存**

> 页面显示以下信息：

标记	含义
CODESYS	CODESYS 数据已占用的内存容量（以千字节为单位）
free	可用内存（以千字节为单位）

调用菜单页面时，即会读取内存空间的当前使用量。 显示菜单页面时，不会刷新此类值。 因此，显示的值不会反映有关内容容量（例如通过 CODESYS 项目的下载导致的）的任何变化。

若要更新显示的值：

► 退出 [Diagnosis] 菜单页面。

► 重新访问 [Diagnosis] 菜单页面。

> 菜单页面将显示装置的当前内容使用量。

5.4.2 系统：信息

7281

[Information] 菜单项目提供对系统组件相关版本信息的访问权限。

显示版本信息

11774

若要显示装置硬件和软件组件的相关信息：

1 选择菜单页面

►  > 

► 选择 [Version] 选项卡。

2 显示版本信息

> 页面显示以下信息：

标记	含义	可能的值
[Type]	装置的货号	例如 AC140n
[SN]	装置的序列号	例如 000000113034
[Build]	已安装固件的版本号	例如 3.1.2
[HW version]	装置主板的版本号	例如 AA

5.4.3 系统：设定

7274

[Setup] 菜单项目提供对系统配置选项的访问权限。

设定输出访问权限

9100

为 AS-i 从站的输出功能设定控制实例：

1 选择菜单页面

►  > 

► 选择 [System settings] 选项卡.

2 为 AS-i 从站的输出功能配置控制实例

► 从[Output access]列表中选择所需值：

参数	含义	可能的值	
		Gateway =	更高级 PLC 控制 AS-i 从站的输出功能。
		Manual =	操作员经由图形用户界面控制 AS-i 从站的输出功能。
		PLC =	设备内部 PLC 控制 AS-i 从站的输出功能。

3 保存更改

► 按下[Accept selection]以保存更改。

> 所选实例控制 AS-i 从站的输出功能。

如果选择值 PLC，系统将自动启用设备内部 PLC (→ **启用/禁用设备内部 PLC** (→ 页 90)).

启用/禁用设备内部 PLC

15841

通知

机器/设备材料损坏的风险！

禁用设备内部 PLC 时，将停止所有正在运行的 PLC 应用程序。 这在 PLC 配置为 AS-i 从站输出功能的控制单元时，可能会对受控过程产生不良影响。

► 禁用设备内部 PLC 前，应以受控方式终止 PLC 应用程序！
(→ **控制 PLC 应用程序** (→ 页 84))

► 为 PLC 应用程序编程时，实施安全状态！

激活设备内部 PLC 时，将自动启动设备上存储的 PLC 应用程序。

► 为 PLC 应用程序编程时，实施安全启动状态！

设定内部可编程逻辑控制器 (PLC)：

1 **选择菜单页面**

►  > 

► 选择 [System settings] 选项卡.

2 启用/禁用**设备**内部 PLC

> 设定组中的以下参数 [Activate CODESYS PLC]:

参数	含义	可能的值	
		☐ =	已禁用设备内部 PLC。
		☑ =	已启用设备内部 PLC。

> 已应用所选值。

设定装置周期

11780

通知

机器/设备材料损坏的风险！

过短的设备周期可能会对 PLC 与外围设备（更高级 PLC，AS-i 从站）之间处理和控制数据的正确传送产生不良影响。

► 确保足够长的周期时间！

如果已禁用 PLC，则设备会以 `0.7 ms` 的固定周期时间工作。

如果已启用 PLC，则操作员可将设备周期设定为介于 `1.5 ms` 与 `3.0 ms` 之间的值。 (→ **启用/禁用设备内部 PLC** (→ 页 90))

设定设备周期：

1 **选择菜单页面**

►  > 

► 选择 [System settings] 选项卡.

2 **设定装置周期**

► 按需要设定以下参数：

参数	含义	可能的值	
		1.5 ms =	1.5 毫秒
		2.0 ms =	2.0 毫秒
		2.5 ms =	2.5 毫秒
		3.0 ms =	3.0 毫秒

3 保存更改

► 按下 [Accept selection].

> 已应用所选值。

切换菜单语言

7088

若要选择 GUI 文本的语言：

1 选择菜单页面

►  > 

► 选择 [System settings] 选项卡。

2 选择菜单语言

> 列表 [Language] 显示在显示 GUI 文本时所用的活动语言。

► 按需要设定以下参数：

参数	含义	可能的值	
		Deutsch	德语
		English	英语
		Français	法语
		Español	西班牙语
		Italiano	意大利语
		Português	葡萄牙语

3 保存更改

► 按下 [Accept selection]。

> GUI 元素以请求的语言显示。

可选：使用组合键切换语言

15834

装置上的可用语言保存于有序列表中：

- 德语
- 英语
- 法语
- 西班牙语
- 意大利语
- 葡萄牙语

若要使用组合键切换语言（从活动语言）：

► 按 [▶] + [▲] 以在列表中选择上一种语言。

“或”：

► 按 [▶] + [▼] 以在列表中选择下一种语言。

> GUI 元素以请求的语言显示。

组合键让您可从任何菜单页面更改语言。

设定显示屏的运行状况

9107

若要设定显示屏运行状况（屏幕保护程序，非活动状态时的运行状况）：

1 **选择菜单页面**

►  > 

► 选择 [System settings] 选项卡。

2 **设定显示屏的运行状况**

► 按需要设定以下参数：

参数	含义	可能的值	
		☐	屏幕保护程序处于非活动状态： 显示屏保持永久开启。
		☑	屏幕保护程序处于活动状态： 显示屏在处于非活动状态 10 分钟后关闭。
		☐	屏幕上保持显示当前所选的菜单页面。
		☑	经过设定时间后，显示屏自动切换至开始屏幕。

> 已应用所选值。

设定系统时间

10954

系统时间包含日期和时间。 装置提供以下选项以供设定系统时间：

- 手动： 操作员手动设定日期和时间。
- 通过 NTP 服务器： 装置拥有 NTP 客户端。 系统时间可通过 NTP 服务器来同步。
- 应用电脑/便携电脑的系统时间： 装置采用电脑/便携电脑的系统时间（仅可通过装置的 Web 界面来使用）

若要设定系统时间：

1 **选择菜单页面**

►  > 

► 选择 [Clock] 选项卡。

2 **显示当前系统时间设定**

> 以下参数显示当前系统时间设定：

参数	含义	可能的值	
			已禁用 NTP 客户端： 装置采用为 [Time] 和 [Date] 手动设定的值。
			NTP 客户端未启用： 装置从 NTP 服务器采用 [Time] 和 [Date] 的值。
		NTP not active 	已禁用 NTP 客户端： 为 [Time] 和 [Date] 手动设定的值适用。
		NTP waiting 	NTP 客户端已启用： 装置等待来自 NTP 服务器的消息。
		NTP successful 	NTP 客户端已启用： 与 NTP 服务器的时间同步成功。
[Time]	系统时间 （格式 [hh:mm:ss]）	例如，12:23:56	
[Date]	系统日期 （格式 [yyyy-mm-dd]）	例如，2014-04-23	

3 **选择配置方法**

► 选择以下任一方法：
- ***手动设定系统时间*** (→ 页 96)
- ***将系统时间与 NTP 服务器同步*** (→ 页 97)
- ***采用电脑的系统时间：*** (→ 页 98)

手动设定系统时间

10963

若要手动设定系统时间：

1 **选择菜单页面**

►  > 

► 选择 [Clock] 选项卡。

2 **禁用装置的 NTP 客户端**

► 取消选中 [Activate NTP] (→ **设定系统时间** (→ 页 95)) 。

► 按下 [Accept selection]。

> 更改生效。

> NTP 状态： `NTP not active` 

3 **手动设定系统时间**

► [Time] 和 [Date] 必须予以设定 (操作注意事项：→**数值字段** (→ 页 40))

> 已应用所选值。

无法手动更改秒钟。 离开编辑模式时，会自动将秒钟设为 `0`。

将系统时间与 NTP 服务器同步

10969

若要将系统时间与 NTP 服务器同步：

若要通过网络时间协议 (NTP) 同步系统时间和日期，请直接或通过网络将装置的配置接口连接至 NTP 服务器。

1 选择菜单页面

►  > 

► 选择 [Clock] 选项卡。

2 禁用 NTP 客户端

► 取消选中 [Activate NTP]（ →**设定系统时间** (→ 页 95)）。

> 可以编辑 IP 地址字段和 [NTP-Offset] 列表。

3 设定 NTP 服务器的 IP 地址和 NTP 偏移量

► 按需要设定以下参数：

参数	含义	可能的值	
IP 地址字段	NTP 服务器的 IP 地址	例如 192.168.0.100	
		无偏移量	系统时间从无偏移量的 NTP 服务器处获取
		UTC -12:00 ... UTC +12:00	按照 UTC 分区采用时区（将加/减显示的小时数）

► 按下 [Accept selection]。

> 装置尝试将系统时间与 NTP 服务器同步。

> NTP 状态： NTP waiting

若成功同步：

> NTP 状态： NTP successful

> [Time] 和 [Date] 显示已同步值。

若同步失败：

► 检查配置接口的 IP 参数设定。

► 检查 NTP 服务器的 IP 地址。

► 重复该过程。

采用电脑的系统时间：

15756

此功能仅可通过装置的 Web 界面执行。

若要采用电脑/便携电脑的日期和时间：

1 **转到装置的 Web 界面**

► 将电脑/便携电脑连接至装置的配置接口 (X3)。

► 启动 Web 浏览器并访问装置的 Web 界面。

2 **选择菜单页面**

►  > 

► 选择 [Clock] 选项卡。

3 **采用电脑/便携电脑的系统时间**

► 取消选中 [Activate NTP] (→**设定系统时间** (→ 页 95)) 。

► 在 [Apply Time and Date from the PC] 组中，按下 [OK]。

> 装置应用电脑/便携电脑的日期和时间。

> [Date] 和 [Time] 显示系统时间。

克隆设备配置

7087

AC140n 可实现创建当前设备配置的映像、将其传输至另一设备并在此激活（克隆）。 配置文件的导出/导入经由 SD 卡执行。

设备配置包括以下设定：

- 系统设定
- AS-i 1/AS-i 2 设定
- Profinet 设定
- PLC 应用程序（包括 PLC 任务配置和变量）

用户仅可经由设备的本地用户界面访问此功能！

仅在符合以下条件时，方可实现克隆设备配置。

- 源和目标设备拥有相同的固件版本
- 源和目标设备拥有相同的产品编号。

保存装置配置

16199

请注意相关注意事项 (→**克隆设备配置** (→ 页 98)) ！

若要将当前有效的装置配置保存于 SD 卡上：

1 **选择菜单页面**

►  > 

> 选择 [Configuration] 选项卡。

2 保存装置配置

► 将拥有充足可用空间的 SD 卡插入 SD 卡插槽中。

► 按下 [Export Configuration]。

> 装置会将当前有效的装置配置存储于 SD 卡上。

恢复设备配置

14442

通知

不良系统运行状况的风险！

在恢复过程中，AC140n 不可用。

► 通过组织措施确保在恢复过程中 AC140n 系统处于安全状态！

16200

通知

数据丢失和不良系统运行状况的风险！

如果装置配置的导入中断（例如，因为装置与电路断开连接），则并非所有配置数据均会保存于装置上。

► 请勿中断恢复过程！

► 确保提供稳定的电压供应器！

请注意相关注意事项（→**克隆设备配置** (→ 页 98)）！

如果有一个以上的装置配置存储于 SD 卡的根目录中，则会将最新的文件（时间标识）用于还原过程。

若要将已存储的装置配置传输至装置：

1 **选择菜单页面**

►  > 

► 选择 [Configuration] 选项卡。

2 **还原装置配置**

► 将带有已存储装置配置的 SD 卡插入 SD 卡插槽中。

► 按下 [Import configuration] 按钮。

> 将显示警告消息。

► 使用 [OK] 来确认消息。

> 将加载装置配置，并将其存储至装置上。

装置将重新启动。

系统复位

8977

复位设备：

1 **选择菜单页面**

►  > 

► 选择 [Reset] 选项卡.

2 **执行系统复位**

► 按下 [Restart].

> 安全查询将显示。.

► 按下[OK]以确认安全提示。

> 设备将重新启动。

存储诊断协议

7040

使用诊断协议，用户可将当前装置配置存档或通过装置设定为服务人员提供所有相关信息。

诊断协议包含使用所选用户语言的以下信息：

- AS-i 配置
- Profinet 配置
- 系统设定
- CODESYS 信息
- OSC 历史记录

此功能仅可通过装置的 Web 界面来使用 (→***远程访问*** (→ 页 43)) 。

要求：

► 连接装置与电脑/便携电脑 (→ ***Configuration interface: connection concepts*** (→ 页 150)) 。

► 启动 Web 浏览器并打开装置的 Web 界面 (→ ***推荐的浏览器*** (→ 页 44)) 。

1 选择菜单页面

►  > 

► 选择 [Diagnostic protocol] 选项卡。

2 存储诊断协议

► 按下 [Generate diagnostic protocol] 按钮。

> AC140n 生成诊断协议。

> 进度栏指示过程的状态。

> 对话窗口将显示。

► 选择文件名和内存位置并按 [OK] 以确认。

> 诊断协议作为 HTML 文件存储于所选位置。

5.4.4 系统：诊断

9053：

[Diagnosis] 菜单项目提供对装置诊断数据的访问权限。

显示诊断数据

15827

若要显示装置的诊断数据：

1 **选择菜单页面**

▶  > 

2 **显示诊断数据**

> 页面显示以下信息：

标记	含义	可能的值	
Power-on t. [YY-DDD HH:MM]	系统和组件的工作时间		
▪ total	装置的工作时间		
▪ current	自上次系统启动起的装置工作时间		
▪ LCD	LCD 的工作时间		
▪ PLC	控制器的工作时间		
Temperature	当前装置温度	以 [°C] 为单位的指示 (→ 注意事项)	
		Aux	电压通过 AS-i 网络和 24 V 辅助设备单独供应。
		AS-i	电压仅通过 AS-i 网络供应。
		Power Module	电压通过数据解耦模块供应。

AC140n 的温度监控持续检查系统温度是否超过允许的最大值。 如果超过特定限值，则温度监控会生成警告或错误消息，显示于 →**在线支持中心 (OSC)** (→ 页 141)。

以下温度范围适用：

- 正常范围 (0 °C ... 80 °C)：无警告，无错误消息
- 过渡范围 (80.1 °C ... 85 °C)： 警告
- 临界区： (> 85.1 °C)：错误消息

5.5 接口

7986

[Interfaces] 菜单提供对装置接口配置选项的访问权限。

导航路径	功能
	配置接口 →***手动配置 IP 参数*** (→ 页 106) →***自动配置 IP 参数*** (→ 页 107) →***显示 EtherNet 信息*** (→ 页 108)
	Profinet 接口 →**接口： Profinet 接口** (→ 页 109)

5.5.1 接口：配置接口

7279

[Configuration interface] 菜单提供对 EtherNet 配置接口（端口 X3）设定的访问权限。

有关 IP 设定的注意事项

14856

装置提供以下选项，用于配置 EtherNet 配置接口：

- Manual = 操作员手动设定接口参数（IP 地址、网络掩码、网关地址）。
- 自动 = 自动设定接口参数。 操作员可在这些协议之间选择：
  – 动态主机配置协议 (DHCP)
  – 零配置网络 (Zeroconf)

若要显示当前的配置方法和配置接口的已启用 IP 参数：

1 **选择菜单页面**

►  > 

► 选择 [IP setup] 选项卡。

2 **显示已启用设定**

> 以下参数显示已启用设定：

参数	含义	可能的值	
		☐	通过操作员执行的接口参数手动指定
		☑	接口参数的自动指定
		Static	操作员手动设定 IP 参数。
		DHCP	IP 参数通过 DHCP 服务器设定。
		Zeroconf	IP 参数使用 Zeroconf 协议自动设定。
[IP address]	接口的 IP 地址	例如 192.168.0.100	
[Subnet mask]	网络段的网络掩码	例如 255.255.255.0	
[Gateway address]	网络网关的 IP 地址	例如 192.168.0.1	

► 选择以下任一选项：
– ***手动配置 IP 参数*** (→ 页 106)
– ***自动配置 IP 参数*** (→ 页 107)

手动配置 IP 参数

14860

若要手动配置配置接口的 IP 参数：

1 选择菜单页面

►  > 

► 选择 [IP setup] 选项卡。

2 禁用 NTP 客户端

► 取消选中 [Optain IP address autom.] (→**有关 IP 设定的注意事项** (→ 页 105)) 。

> IP 地址字段 [IP address]、[Subnet mask] 和 [Gateway address] 可供编辑。

3 配置 IP 参数

► 按需要配置以下参数 (→**有关 IP 设定的注意事项** (→ 页 105)) ：
– [IP address]
– [Subnet mask]
– [Gateway address]

4 保存更改

► 按下 [Accept] 按钮。

> 已应用所选值。

> [IP status] 显示已启用配置方法： 静态

自动配置 IP 参数

14859

装置必须连接至 DHCP 服务器，以通过 DHCP 自动接收接口参数。

► 将配置接口 (X3) 连接至 DHCP 服务器。

若要自动配置配置接口的 IP 参数：

1 **选择菜单页面**

►  > 

► 选择 [IP setup] 选项卡。

2 **启用 NTP 客户端**

► 激活 [Optain IP address autom.] 复选框 (→**有关 IP 设定的注意事项** (→ 页 105))

3 保存更改

► 按下 [Accept] 按钮。

> 装置尝试从 DHCP 服务器获取 IP 参数。

> 如果通过 DHCP 服务器配置 IP 参数失败，则装置会使用 Zeroconf 协议生成 IP 参数。

> [IP address]、[Subnet mask] 和 [Gateway address] 显示设定 IP 参数。

> 已应用所选值。

> [IP status] 显示已启用配置方法： DHCP 或 Zeroconf。

IP 参数的自动配置需要约 10 秒钟的时间。

显示 EtherNet 信息

14857

若要显示有关配置接口的以太网信息：

1 **选择菜单页面**

►  > 

► 选择 [Ethernet informationen] 选项卡。

2 **显示以太网信息**

> 页面显示以下信息：

标记	含义
[MAC ID]	接口的 MAC 标识号

5.5.2 接口： Profinet 接口

8019

[Profinet] 菜单提供对有关 Profinet 接口的信息、设定和诊断数据之访问权限。

导航路径	功能
	Profinet 信息 →**显示 I&M 信息** (→ 页 110) →**显示 Profinet 数据** (→ 页 111) →**显示模块配置** (→ 页 112) →**下载 GSDML 文件** (→ 页 113)
	Profinet 设定 →**Profinet 接口** (→ 页 113)
	Profinet 诊断 →**显示诊断数据** (→ 页 114)

Profinet： 信息

11781

菜单项目 [Information] 提供对 Profinet 接口相关信息的访问权限。

显示 I&M 信息

9116

若要显示 I&M 信息（I&M = 识别和维护）：

1 **选择菜单页面**

►  >  > 

► 选择 [I&M information] 选项卡。

2 **显示 I&M 信息**

> 页面显示以下信息：

标记	描述
[Manufacturer ID]	制造商 ID
[Order number]	装置的货号
[SN]	装置的序列号
[HW version]	设备的硬件版本
[SW version]	设备的固件版本
[Revision no.]	设备的修订号
[Profile ID]	装置行规的 ID
[Profile type]	装置行规的类型
[I&M version]	I&M 数据的版本

显示 Profinet 数据

9119

若要显示 Profinet 参数和特定装置参数：

1 选择菜单页面

►  >  > 

► 选择 [Profinet data] 选项卡。

2 显示 Profinet 数据

> 页面显示以下信息：

标记	描述	可能的值	
[Device information] ▪ [MAC ID] ▪ [Device name] ▪ [IP address] ▪ [Device type]	Profinet 装置的参数 装置的 MAC-ID 装置的名称 Profinet 接口的 IP 地址 装置的类型	例如 00:02:01:01:98:D4 例如： 例如 asi-pn	
[Host information] ▪ [IP address] ▪ [Host name]	Profinet 控制器（主机）的参数 Profinet 控制器的 IP 地址 Profinet 控制器的标记	例如 192.168.10.1	
		Unknown	装置未连接至现场总线主站
		1 channel	每个单从站 1 个通道 “或”： 每个 A 从站 1 个通道
		2 channels	每个单从站 2 个通道 “或”： 每个 A 从站 2 个通道
		4 channels	每个单从站 4 个通道 “或”： 每个 A/B 从站 2 个通道
[Analog. channels/O-slave]	每个已计划输出从站的模拟通道数目	→[Analog. channels/I-slave]	
		Reset outputs	输出功能复位至预设值
		Hold outputs	输出功能保持为就在连接中断前可用的值。
		☐	未下载参数，即 AS-i 从站通过装置上设定的参数来激活。

		☑	已下载参数，即建立连接时，在计划软件中设定的 AS-i 从站参数由控制器通过 Profinet 下载至装置。
		☐	网关中发生错误时，不传送任何 Profinet 警报
		☑	网关中发生错误时，传送 Profinet 警报
		☐	从站半字节指定保持不变
		☑	从站半字节指定已交换

有关特定装置参数的详细信息： →**特定装置参数** (→ 页 174)

显示模块配置

14192

若要显示 Profinet 模块的活动配置：

1 **选择菜单页面**

►  >  > 

► 选择 [Module configuration] 选项卡。

2 **显示模块配置**

> 页面显示 Profinet 插槽的活动模块配置（→ 附录）。

现场总线插槽仅可在 Profinet 计划软件中配置。

下载 GSDML 文件

14188

此功能仅可通过装置的 Web 界面来使用 (→*远程访问* (→ 页 43)) 。

要求：

- ► 连接装置与电脑/便携电脑 (→ *Configuration interface: connection concepts* (→ 页 150)) 。
- ► 启动 Web 浏览器并打开装置的 Web 界面 (→ *推荐的浏览器* (→ 页 44)) 。

1 **选择菜单页面**

- ►  >  > 
- ► 选择 [GSDML file] 选项卡。
- > 将显示菜单页面 [GSDML file]。

2 **下载 GSDML 文件**

- ► 鼠标单击 [Download GSDML file] 以下载装置描述。

Profinet： 设定

16196

[Setup] 菜单项目提供对 Profinet 接口配置选项的访问权限。

Profinet 接口

15855

我们建议将现场总线安装于 Profinet 控制器上并在装置上采用配置。

若要通过 Profinet 配置接口：

1 **选择菜单页面**

- ►  >  > 

2 **设定 Profinet 接口的 IP 参数**

- ► 按需要设定以下参数：

参数	描述	可能的值
[IP address]	Profinet 接口的 IP 地址	例如 192.168.10.3
[Subnet mask]	Profinet 网络段的网络掩码	例如 255.255.255.0
[Gateway address]	Profinet 网关的 IP 地址	例如 192.169.10.1

3 保存更改

► 按下 [Accept] 按钮。

> 已应用所选值。

Profinet： 诊断

9126

菜单项目 [Diagnosis] 提供对 Profinet 接口诊断数据的访问权限：

显示诊断数据

15876

若要通过 Profinet 显示诊断数据：

1 选择菜单页面

►  >  > 

2 显示诊断数据

> 页面显示以下信息：

标记	描述	可能的值	
[Profinet connection status]	Profinet 接口连接状态的显示		
			未连接至 Profinet 控制器
			已建立与 Profinet 控制器的连接
			未连接至 Profinet 控制器
			已建立与 Profinet 控制器的连接

5.6 IFM 系统解决方案

7065

此菜单仅可通过 AC140n 的 Web 界面来使用。
→***远程访问*** (→ 页 43)

[ifm system solutions] 菜单提供对 IFM 系统解决方案的信息和安装选项之访问权限。

导航路径	功能
	IFM 系统解决方案： →***显示已安装 IFM 应用程序的相关信息*** (→ 页 117) →***安装单一/基本应用程序*** (→ 页 118) →***安装多重应用程序*** (→ 页 119) →**更新 IFM 应用程序** (→ 页 120) →***卸载 IFM 应用程序*** (→ 页 121)

5.6.1 有关 IFM 系统解决方案的注意事项

12229

通过 AC140n，IFM 电子提供了可供轻松实施一般应用程序的不同系统解决方案。 系统解决方案包括由设备内部 CODESYS PLC 处理的应用程序。

不得同时在 AC140n 上存储和运行 IFM 系统解决方案和用户创建的 应用范围。

► 安装新的 IFM 系统解决方案或用户应用程序前，删除设备上存储的所有 CODESYS 系统解决方案！

仅在已激活设备内部 PLC 时，方可安装和运行 IFM 系统解决方案。

► 激活 AC140n 的 PLC (→ **启用/禁用设备内部 PLC** (→ 页 90))!

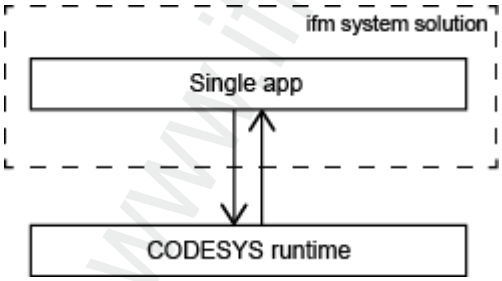
用户可从 IFM 网站下载可用 IFM 系统解决方案。
→ www.ifm.com > 客户服务 > 下载 > 总线系统 AS-Interface

IFM 系统解决方案的类型

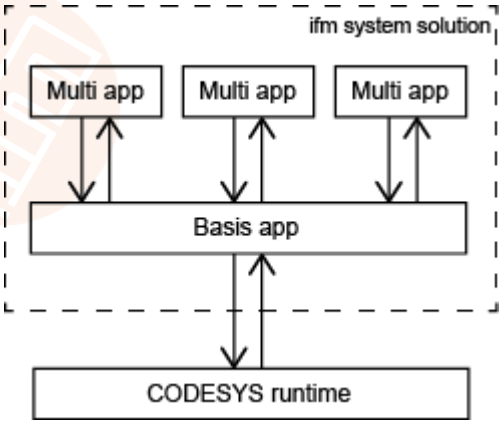
8682

有 2 种类型的 IFM 系统解决方案：

- **单一应用程序**
  单一应用程序为用户提供基于 CODESYS 的解决方案。 单一应用程序直接访问 CODESYS PLC 的输入/输出机制。 仅可在装置上存储和执行一个单一应用程序。



- **基本应用程序 + 多重应用程序**
  多重应用程序让用户有可能并行执行基于 CODESYS 的不同解决方案。 多重应用程序使用基本应用程序的服务，以便能同时访问 AC140n 的输入功能和输出功能。 它们作为 CODESYS PLC 输入/输出机制与已连接多重应用程序之间的纯通信层来工作。
  装置上一次最多可存储和并行执行 5 个多重应用程序。



5.6.2 显示已安装 IFM 应用程序的相关信息

9041

为了显示装置上已安装 IFM 系统解决方案的相关信息：

1 选择菜单页面

► 

► 选择 [Information] 选项卡。

2 显示已安装 IFM 应用程序的相关信息

> 浏览器窗口显示已安装 IFM 应用程序的概述。 将显示每个 IFM 应用程序的以下信息：

信息	含义
[Name]	IFM 系统解决方案应用程序的标记
[Version]	IFM 系统解决方案应用程序的版本号
[Type]	IFM 应用程序的类型（单一、基本、多重）
[Description]	IFM 系统解决方案应用程序功能的说明
[Licence information]	使用所选用户语言的 IFM 系统解决方案之相关许可证信息
[Link to the ifm system solution app]	IFM 系统解决方案应用程序 Web 可视化的超链接

5.6.3 安装单一/基本应用程序

7092

必须在装置上仅存储一个单一应用程序、基本应用程序或 CODESYS PLC 应用程序。
安装单一/基本应用程序时，将删除所有 IFM 系统解决方案和装置上存储的 CODESYS PLC。

若要在装置上安装单一或基本应用程序：

1 选择菜单页面

► 

► 选择 [Installation] 选项卡。

2 选择单一/基本应用程序

► 激活 [Search] 按钮。

> 对话窗口将显示。

► 选择所需的单一/基本应用程序 (*.ifmapp) 并单击 [Open] 以加载。

> 将显示所选单一/基本应用程序的文件名。

3 将单一/基本应用程序传输至装置

► 单击 [Transfer file] 按钮以将所选单一/基本应用程序传输至装置。

> 进度栏指示过程的状态。

> 成功传输后： 窗口显示已复制单一/基本应用程序的相关信息。

► 可选： 单击 [Cancel] 以停止下载过程。

4 安装单一/基本应用程序

► 激活 [Start installation] 按钮。

> 将停止 CODESYS PLC。

> 将删除装置上的所有 IFM 系统解决方案和 CODESYS PLC。

> 已安装所选单一/基本应用程序。

> 进度栏指示安装过程的状态。

> 将启动 CODESYS PLC。

> 将自动启动已安装的单一/基本应用程序（“运行”状态）。

5.6.4 安装多重应用程序

6954

必须在装置上同时存储最多 5 个多重应用程序。

若要在装置上安装多重应用程序：

要求：

> 已安装和启动基本应用程序（“运行”状态）（→***安装单一/基本应用程序*** (→ 页 118)）

1 选择菜单页面

► 

► 选择 [Installation] 选项卡。

2 安装多重应用程序

► 激活 [Search] 按钮。

> 对话窗口将显示。

► 选择所需的多重应用程序 (*.ifmapp) 并单击 [Open] 按钮以加载。

> 将显示所选多重应用程序的文件名。

3 将多重应用程序传输至装置上

► 单击 [Transfer file] 以将所选多重应用程序传输至装置上。

> 进度栏指示过程的状态。

> 成功传输后： 窗口显示已复制多重应用程序的相关信息。

► 可选： 单击 [Cancel] 以停止下载过程。

4 安装多重应用程序

► 激活 [Start installation] 按钮。

> 将停止 CODESYS PLC。

> 将安装所选多重应用程序。

> 进度栏指示安装过程的状态。

> 将启动 CODESYS PLC。

> 将自动启动已安装的多重应用程序（“运行”状态）。

► 可选： 重复步骤 2 至 4 以安装其他多重应用程序。

5.6.5 更新 IFM 应用程序

6925

用户可通过用新版本的 IFM 系统解决方案予以覆盖，来更新装置上已安装的 IFM 系统解决方案。

IFM 应用程序的命名约定：

`AppName_x.y.z.ifmapp`

AppName =	IFM 应用程序的名称
x.y.z =	IFM 应用程序的版本号
ifmapp =	IFM 应用程序的文件扩展名

若要更新 IFM 系统解决方案：

要求：

> 新 IFM 应用程序和已安装 IFM 应用程序的名称必须相同。
> IFM 应用程序的版本号必须大于已安装 IFM 应用程序的版本号。

若要确定已安装 IFM 应用程序的版本： →***显示已安装 IFM 应用程序的相关信息*** (→ 页 117)

1 下**载新 IFM 应**用程序

► 下载 IFM 系统解决方案的新版本 (→**有关 IFM 系统解决方案的注意事项** (→ 页 115)) 。

2 更新已安装 **IFM 应**用程序

► 安装新的 IFM 系统解决方案

– 单一/基本应用程序： →***安装单一/基本应用程序*** (→ 页 118)

– 多重应用程序： →***安装多重应用程序*** (→ 页 119)

5.6.6 卸载 IFM 应用程序

428

卸载基本应用程序时，也会卸载所有从属多重应用程序。

卸载 IFM 应用程序前，AC140n 的 CODESYS PLC 会停止。 成功卸载后，CODESYS PLC 会重新启动。

若要卸载装置上安装的 IFM 系统解决方案：

1 **显**示已安装 **IFM 应**用程序

► ***显示已安装* IFM 应用程序的相关信息** (→ 页 117)

2 卸**载 IFM 应**用程序

► 在相应的 IFM 应用程序部分中：
激活 [Uninstall app] 按钮。

> 将停止 CODESYS PLC。

> 将卸载所选 IFM 应用程序。

> 将启动 CODESYS PLC。

6 设定

内容

15844

此部分提供在安装、电气安装和连接至 AS-i 网络组件后，设定装置的相关信息。

遵守有关装置安装和电气连接的注意事项！

→ 操作说明（装置随附）

6.1 连接设备

9000

6.1.1 命令通道原则

8329

循环命令由一个请求和一个反应组成。 命令请求在输出集合中传送。 IO-Link 主站的命令反应在输入集合中传送。

下表显示了非循环通讯通过非循环命令通道的一般处理流程。

步骤	输出集合	输入集合
1	► [Trigger] = 0 > 请求区域中的数据无效。	--
2	► 写入请求区域的数据： - 端口（字节 4 和 5） - 索引（字节 6 和 7） - 子索引（字节 8 和 9） - 命令（字节 10） - 数据（11...43）	--
3	► [Trigger] = 1 > 命令已传送	> [Handshake] = 0
4	--	► 读取 [Handshake]。 如 [Handshake] = 0x0： > 反应区域中的数据无效。 ► 继续执行步骤 4 如 [Handshake] = 0x1 > 反应区域中的数据有效。 ► 继续执行步骤 5
5	--	► 读取 [Result] 字节（字节 11） 如果 [Result] = 0x00 > 命令已处理完毕，没有错误 如果 [Result] = 0x01： > 处理命令时发生错误。 ► 读取诊断代码（字节 13） ► 消除错误并重复执行命令

6.1.2 配置接口

10909

经由配置接口（例如 Web 接口，设备内部 CODESYS PLC 的编程接口）访问设备：

► 将设备的配置接口 (X3) 直接或经由以太网网络连接至编程电脑/便携电脑。
详细信息： → **Configuration interface: connection concepts** (→ 页 150)

6.2 开始屏幕“基本设定”

1226

“基本设定”开始屏幕在以下操作/事件后显示：

- 初次设定
- 固件更新
- 由电池故障导致的数据丢失

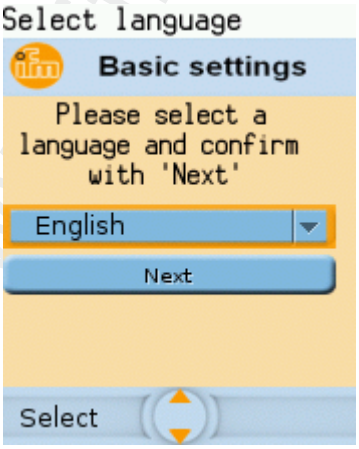
基本设定提供对 GUI 文本、系统时间等的访问权限。

页面视图的相同操作注意事项也适用于“基本设定”开始屏幕 (→ ***页面视图*** (→ 页 27)) 。

6.2.1 更改装置的基本设定

18511

若要更改装置的基本设定：



1 启动装置

► 将装置连接至电路。

> 装置启动。

> 显示屏显示开始屏幕“基本设定”（图片）。

2 设定 GUI 文本的语言

► 列表显示活动语言。

► 使用 [▼] / [▲] 来选择列表。

> 焦点（= 橙色框）位于所选列表上。

► 使用左侧功能键 [Select] 打开列表。

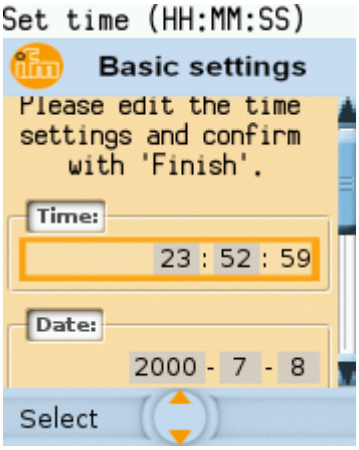
► 使用 [▼] / [▲] 来标记所需语言并按 [Select] 以将其激活。

> GUI 文本以所选语言显示。

► 按 [Next] 以转到下一页。

3 设定系统时间

可选方式 1： 手动设定系统时间



► [Time] 和 [Date] 显示当前系统时间。

► 激活 [Activate NTP] 复选框。

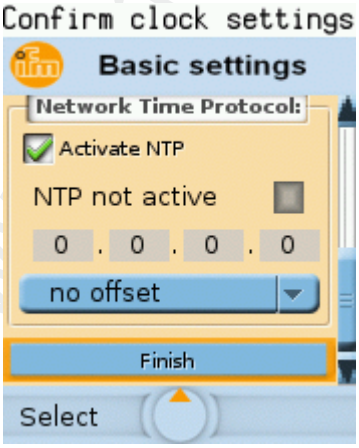
> 状态 LED = ■

► 在 [Time] 组中，以一次一个位置的方式设定所需的时钟时间。

► 在 [Date] 组中，以一次一个位置的方式设定所需的日期。

► 按 [Finish] 以保存更改并转到标准开始屏幕。

可选方式 2： 将系统时间与 NTP 服务器同步



► 激活 [Activate NTP] 复选框。

> 状态 LED = 

► 在 IP 地址字段中输入 NTP 服务器的 IP 地址。

► 从列表中选择 NTP 服务器的时区（UTC 格式）。

> 装置的 NTP 客户端与筛选 NTP 服务器同步系统时间。

► 等待至状态 LED = 

> [Date] 和 [Time] 显示已同步值。

► 按 [Finish] 以保存更改并转到标准开始屏幕。

6.3 更新设备固件

18399

通知

数据丢失的风险！

中断固件更新会导致当前系统和现场总线设定丢失。

► 执行固件更新前，保护设备设定！ (→ **保存装置配置** (→ 页 99))

► 确保在固件更新时电源电压不间断！

更新设备固件：

► 选择以下选项中的一项：

- **来自 SD 卡的固件更新** (→ 页 130)
- **经由 Web 界面的固件更新** (→ 页 132)

6.3.1 固件更新时设定的运行状况

17058

以下设定/数据记录在固件更新时仍保持有效：

设定/数据记录	菜单页面的路径
GUI 的用户语言	[System] > [Setup] > [System settings]
显示设定（屏幕保护，返回）	[System] > [Setup] > [System settings]
系统时间（日期/时间）	[System] > [Setup] > [Clock]
NTP 设定	[System] > [Setup] > [Clock]
工作时间计数器	[System] > [Diagnosis]
AS-i 主站设定和配置数据	[AS-i 1] / [AS-i 2] > [Master setup]
配置接口的 IP 参数	[Interfaces] > [Configuration interface] > [IP-Setup]
现场总线设定	[Interfaces] > [Profinet] > [Setup]

固件更新时，会使用以下设定/数据记录的默认值来将其重新初始化。

设定/数据记录	复位值	菜单页面的路径
输出功能的控制	网关	[System] > [Setup] > [System settings]
激活 CODESYS PLC	已禁用	[System] > [Setup] > [System settings]
设备周期	0.7 ms	[System] > [Setup] > [System settings]
OSC	删除系统消息	起始页 > [OSC]
保留变量	0x00	--

6.3.2 来自 SD 卡的固件更新

18400

注意有关内存运行状况的注意事项 (→ **固件更新时设定的运行状况** (→ 页 129))!

1 准备

► 从 IFM 网站下载新的固件文件。

► 将固件文件复制至 SD 卡的根目录。

► 将包含固件文件的 SD 卡插入 SD 卡槽中 (→ **SD 卡槽** (→ 页 20)).

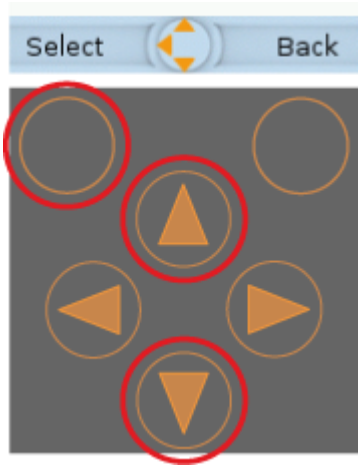
2 启动恢复模式

► 将设备与电路分离。

► 同时执行以下操作：

- 同时按住左侧功能键和箭头键 [▲] 和 [▼] 不放 (→ 图片) 。
- 将设备连接至电路。

► 按住按键不放，直至屏幕 [ifm Recovery] 显示 (约 10 秒) 。



3 更新固件

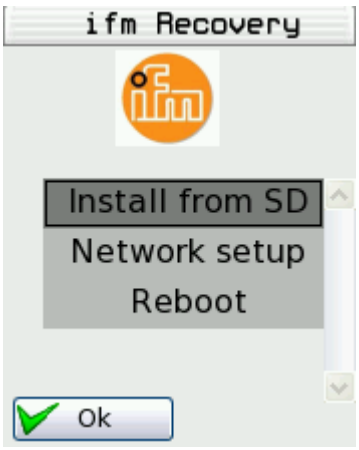
► 使用箭头键 [▲] / [▼] 来选择菜单项目 [Install from SD] (→ 图片) 。

► 使用左侧功能键来按下 [OK]。

> 更新进程启动。

> 显示屏显示固件更新的进度。

> 成功更新固件后，状态消息即会显示。



4 重新启动设备

► 使用箭头键 [▲] / [▼] 来选择 [Reboot] 按钮。

► 按下 [OK] 以重新启动设备。

> 设备使用当前固件重新启动。

> 开始屏幕“基本设定”将显示 (→ **开始屏幕“基本设定”** (→ 页 125)).

6.3.3 经由 Web 界面的固件更新

18401

注意有关内存运行状况的注意事项 (→ **固件更新时设定的运行状况** (→ 页 129))!

5 准备

► 从 IFM 网站下载新的固件文件。

► 将电脑/便携电脑连接至设备的配置接口 (X3)。
(→ **Configuration interface: connection concepts** (→ 页 150))

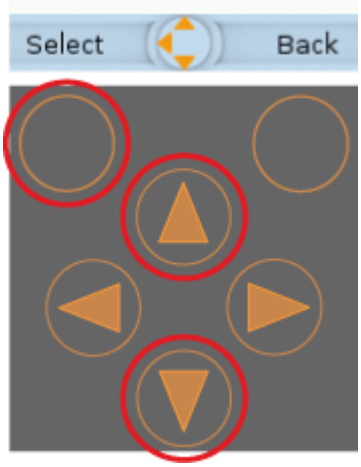
6 启动恢复模式

► 将设备与电路分离。

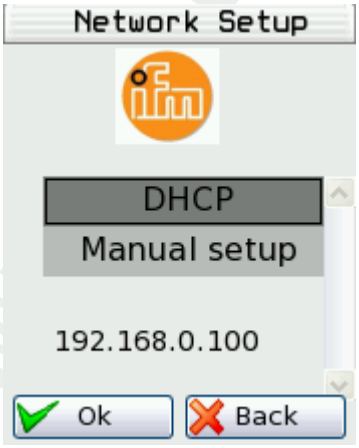
► 同时执行以下操作：

- 同时按住左侧功能键和箭头键 [▲] 和 [▼] 不放 (→ 图片) 。
- 将设备连接至电路。

► 按住按键不放，直至屏幕 [ifm Recovery] 显示 (约 10 秒) 。



7 可选： 调整 IP 参数



► 使用箭头键 [▲] / [▼] 来选择菜单项目 [Network Setup]。

► 按下 [OK] 以转至网络设定。

> 显示屏显示页面 [Network Setup] (→ 图片) 。

> 页面侠士设备的当前 IP 地址。

可选方式 1： 从 DHCP 服务器获取 IP 参数

► 将配置接口连接至 DHCP 服务器。

► 使用箭头键 [▲] / [▼] 来选择菜单项目 [DHCP]。

► 按下 [OK] 以激活设备的 DHCP 客户端。

> 设备从 DHCP 服务器获取 IP 参数。

> 如果不成功，设备将使用 Zeroconf 协议创建 IP 参数。

> 显示屏显示带有新 IP 地址的 [Network Setup] 页面。

► 使用 [Back] 离开网络设定。

> 显示屏显示 [ifm Recovery] 页面。

可选方式 2： 手动配置 IP 参数

► 使用箭头键 [▲] / [▼] 来选择菜单项目 [Manual Setup]。

► 使用 [OK] 激活手动设定。

> 显示屏显示 [Static IP setup] 页面 (→ 图片)

► 使用箭头键 [▲] / [▼] 来相继选择以下菜单项目并按需要予以设定：
- [IP Address]
- [Network Mask]
- [Default gateway]

► 按下 [Apply] 以保存设定值。

> 显示屏显示带有新 IP 地址的 [Network Setup] 页面。

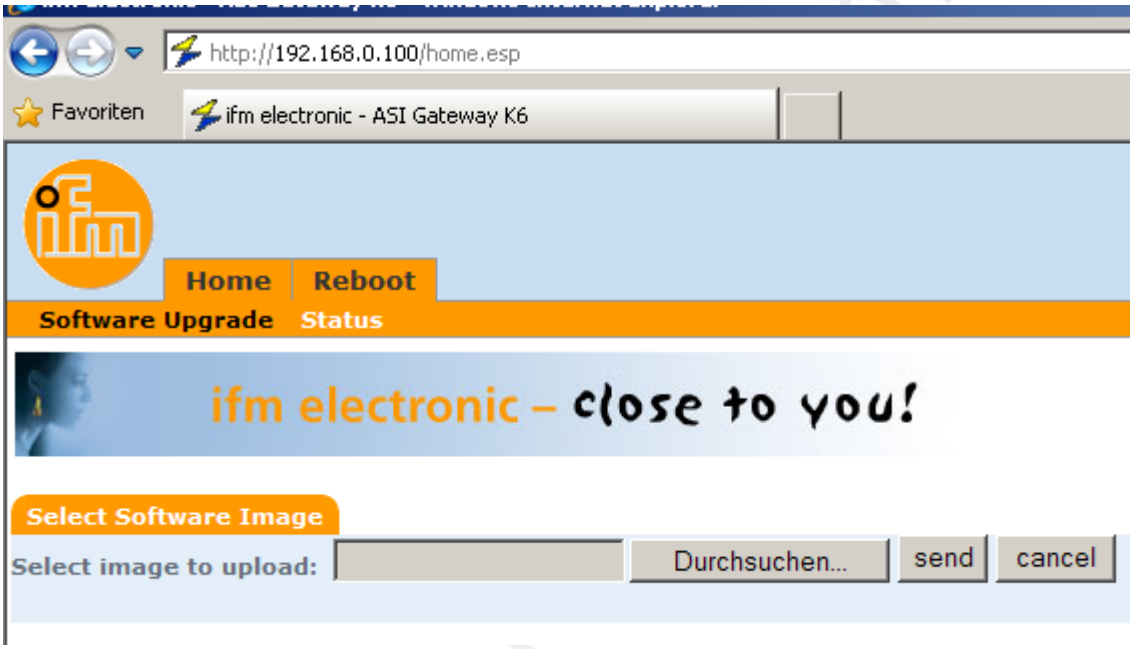
► 使用 [Back] 离开网络设定。

> 显示屏显示 [ifm Recovery] 页面。

8 更新固件

► 访问设备的 Web 界面。

> 恢复模式的 Web 界面将显示：



► 按下 [Search ...] 按钮。

> 文件资源管理器将显示。

► 选择固件文件并按下 [Open]。

> 字段 [Select image to upload] 显示固件文件的文件路径和名称。

► 按下 [send] 以启动更新进程。

> 显示屏和 Web 界面显示固件更新的进度。

> 成功更新固件后，状态消息即会显示。

9 重新启动设备

► 单击选项卡 [Reboot]

> 设备使用当前固件重新启动。

> 开始屏幕“基本设定”将显示 (→ **开始屏幕“基本设定”** (→ 页 125)).

6.4 连接 AS-i 从站并为其设定地址

9004

若要将 AS-i 从站集成至由装置的其中一个 AS-i 主站控制的 AS-i 网络：

1 **连接 AS-i 从站并为其设定地址**

► 按相应的安装说明中所述的方式，将要为其设定地址的“一个”AS-i 从站连接至所需的 AS-i 网络（AS-i 1 或 AS-i 2）。

► 为 AS-i 从站指定所需的地址
（→ ***快速设定：为已连接至 AS-i 主站 1 的 AS-i 从站设定地址*** (→ 页 59)或→ ***快速设定：为已连接至 AS-i 主站 2 的 AS-i 从站设定地址*** (→ 页 61)）。

► 可选： 重复步骤 1 来连接其他 AS-i 从站并为其设定地址。

2 **计划 AS-i 网络**

► 在带有刚设定地址的 AS-i 从站的 AS-i 主站上执行计划调整
（→ ***快速设定：计划 AS-i 网络*** (→ 页 52)）。

> AS-i 主站将检测到的从站 (LDS) 添加至已计划从站 (LPS) 的列表。

> AS-i 从站拥有有效的地址且已集成于 AS-i 网络中。

6.5 设定 Profinet

9007

有关 Profinet 网络配置的详细信息： → Profinet 主站的操作说明

若要将装置集成至 Profinet 网络中：

1 **设定接口参数**

►  >  > 

► 设定接口参数（→ **Profinet 接口** (→ 页 113)）。

2 **将装置与 GSDML 文件集成至 Profinet 项目中**

► 使用 Profinet 配置软件，复制电脑/便携电脑上的装置 GSDML 文件（→ **下载 GSDML 文件** (→ 页 113)）。

► 将带有 GSDML 文件的装置加载至 Profinet 配置软件的装置库（→ Profinet 配置软件的操作说明）。

► 将装置集成至 Profinet 项目中。

3 **设定装置参数、现场总线模块和系统运行状况**

► 在 Profinet 配置软件中设定以下参数：
– 特定装置参数（→ **特定装置参数** (→ 页 174)）
– Profinet 模块（→ **Profinet modules** (→ 页 177)）

► 在 Profinet 配置软件（例如电子狗）中设定系统运行状况

4 **配置激活**

► 存储配置并加载至 Profinet 控制器（下载）。

► 通过 Profinet 启动控制器。

> 装置将集成至 Profinet 网络（→ Profinet 接口的状态 LED）

5 **选择**

►  >  > 

► 选择 [Profinet data] 选项卡。

> 页面显示存储的配置。

6.6 配置接口的设定

9006

若要设定 EtherNet 配置接口 (X3)：

►  > 

► 选择 [IP setup] 选项卡。

► 设定接口参数 (→ **有关 IP 设定的注意事项** (→ 页 105)) 。

6.7 替换 AS-i 从站

10249

AC140n 可实现在工作模式“保护模式”下将 AS-i 从站更换为新的 AS-i 从站。

要求：

> 新和旧 AS-I 从站拥有相同的设备行规 (→ **AS-i 从站的行规** (→ 页 162)).

> 新的 AS-i 从站拥有地址 0。

> 参数 [Automat. adressing] 已激活 (→ **设定 AS-i 主站的监控功能** (→ 页 65)).

1 删除旧 AS-i 从站

► 将要从 AS-i 网络替换的 AS-i 从站断开连接

> AC140n 检测配置错误并生成相应的 OSC 消息。

2 安装新 AS-i 从站

► 将新 AS-i 从站连接至 AS-i 网络。

> AC140n 检测新 AS-i 从站并自动指定旧 AS-i 从站的地址。

> OSC 错误消息不再显示。

> 新 AS-i 从站是可操作的。

7 故障排除

内容

7288

本章节提供有关故障检测和排除的信息。

7.1 Status LED

7094

装置的状态 LED 提供系统组件当前状态的相关信息。

装置上的状态 LED 位置： →**AS-i 设备上有什么，位于何处？** (→ 页 18)

7.1.1 状态 LED：基本装置

6950

状态 LED			描述
	绿色	灯	装置已启动，警告或错误消息。
	黄色	闪烁 0.5 Hz	有警告，但是并非错误消息。
	红色	闪烁 2Hz	有错误消息。

7.1.2 状态 LED：现场总线 Profinet

12115

状态 LED			描述
		关闭	无数据传送
		闪烁	数据的接收
		关闭	无实体连接
		灯	实体连接正常
		关闭	无数据传送
		闪烁	数据的接收
		关闭	无实体连接
		灯	实体连接正常

7.2 在线诊断功能

7055

装置提供在线诊断功能。 它可帮助用户找到并排除发生故障源和错误源。

7.2.1 消息类型

18986

AC140n 的在线诊断功能将分区 3 类消息：

符号	消息类型	含义
	false	▪ 发生错误；装置的正常工作受到干扰。 ▪ 绝对需要用户操作
	警告	▪ 发生紊乱情况 ▪ 需要用户操作
	事件	▪ 发生不严苛事件 ▪ 无需用户操作

7.2.2 定位错误源

7063

在线诊断功能可帮助操作员定位出现警告和错误消息的来源。 指向生成消息的菜单页面之导航路径的菜单符号被警告/错误符号所覆盖。 因此，操作员可轻松定位错误源。

示例：

> 以下菜单符号被错误符号所覆盖：
  - 主导航栏： [AS-i 1]
  - 子导航栏： [Slaves]
> 菜单页面 [AS-i 1] > [Slaves] 上的错误源

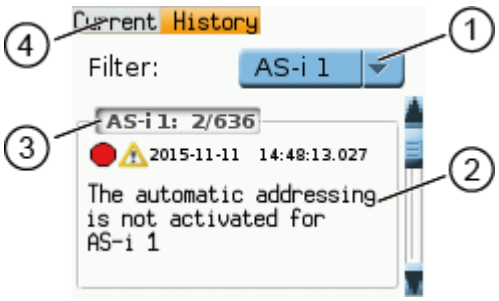
 如果装置的功能单元导致同时出现警告和错误消息，则会显示错误符号。

7.3 在线支持中心 (OSC)

7058

在线支持中心 (OSC) 显示有关发生的事件、故障和错误的详细信息。

OSC 具有以下外观：



① 可选择筛选器的列表以及所选筛选器的名称

② 消息
消息包含错误符号、时间戳和有关错误的详细信息

③ 显示的消息数目以及消息总数

④ 可选择视图的选项卡
[Current]: → **OSC: 查看当前错误消息** (→ 页 142)
[History]: → **OSC： 显示消息历史记录** (→ 页 143)

7.3.1 OSC: 查看当前错误消息

15842

[Current] 选项卡列出所有当前消息。 消息按时间顺序排序。 有关警告和错误的所有消息均会显示。

有关不同消息类型的信息： → **消息类型** (→ 页 140)
设备可能的 OSC 消息概览： → **OSC messages** (→ 页 319)

查看当前处于活动状态的错误消息：

1 **选择菜单页面**

► 

► 选择 [Current] 选项卡.

2 **显示当前消息**

> 该页面显示当前处于活动状态的错误消息。

► 按下 [▼] 以选择消息字段。

> 焦点（橙色框）位于消息字段上。

► 使用 [▲]/[▼] 来查看错误消息。

3 **可选： 筛选器消息**

► 按需要设定以下参数：

参数	含义	可能的值	
		All	按发生的时间顺序显示所有消息（= 预设）。
		AS-i 1	显示在 AS-i 主站 1 中创建的消息。
		AS-i 2	显示在 AS-i 主站 2 中创建的消息(仅可为带有 2 AS-i 主站的装置选择）。
		System	显示在系统中创建的消息。

> 页面显示已过滤的消息。

7.3.2 OSC： 显示消息历史记录

11775

[History] 选项卡列出在装置工作时间内出现的所有消息。 消息按时间顺序显示。 装置显示有关事件、警告和错误的消息。

消息存储于环形缓冲区内。 环形缓冲区可存储 2000 条消息。 如果已满，则装置会覆盖最早的消息（时间标识）。

每个故障（警告，错误）均有一个消息对。 它指示故障的发生时间以及修正故障原因的时间。 消息的符号将予以相应地标记。

示例： 错误消息

 错误发生的时间

 修正故障原因的时间。

若要重新显示到目前为止创建的消息历史记录：

1 **选择菜单页面**

► 在开始屏幕上： 选择 [OSC]。

► 选择 [History] 选项卡。

2 **显示所有消息**

> 页面显示所有先前生成的错误消息。

► 按下 [▼] 以选择消息字段。

> 焦点（橙色框）位于消息字段上。

► 使用 [▲]/[▼] 来查看错误消息。

3 **可选： 过滤消息**

► 按需要设定以下参数：

参数	含义	可能的值	
		All	按发生的时间顺序显示所有消息（= 预设）。
		AS-i 1	显示在 AS-i 主站 1 中创建的消息。
		AS-i 2	显示在 AS-i 主站 2 中创建的消息(仅可为带有 2 AS-i 主站的装置选择）。
		System	显示在系统中创建的消息。

> 页面显示已过滤的消息。

8 附录

内容

7156

8.1 Approval tests / certifications

7157

Software-relevant certifications:

- AS-i master profile M4 according to AS-i specification 3.0
- Fieldbus certification: Profinet class B

8.2 技术资料

内容

9011

8.2.1 Housing

9044

Housing	
Degrees of protection	IP20
Material	Aluminium, steel sheet, Makrolon
Dimensions (W x H x D) [mm]	93 x 128,2 x 106,2

8.2.2 Power supply connections

9047

Power supply connections	
AS-i 1, AS-i 2, FE	plug-in, 6 poles, Combicon
24 V Power supply	plug-in, 2 poles, Combicon

8.2.3 Operation

9046

Membrane keys	
Function keys	2x
Navigation keys / arrow keys	4x

8.2.4 Display elements

9045

Display	
Technology	LCD, colour
Size	35 x 28 mm (1.8“)
Resolution	220 x 176 pixels
Colour depth	18 bits (= 262 144 possible colours)

LED	
Possible colours	red, green, yellow

8.2.5 Interfaces

11070

EtherNet configuration interface	
Connection	1x RJ45
Transmission	10/100 Mbits/s
Protocol	HTTP, FTP, Telnet
Designation	X3

11071

Ethernet fieldbus interface	
Connection	2x RJ45
Protocol	Profinet RT (device), class B
Transmission	10/100 Mbits/s
Switch	integrated 2-port switch (iRT compatible)

11072

SD card slot	
Media	SD memory cards (max. 32 Gbytes)
Format	SDHC format is supported
Supported file formats	FAT, FAT32

8.2.6 Programmable Logic Controller (PLC)

14849

Programmable Logic Controller (PLC)	
Type	CODESYS Control Runtime System (incl. CODESYS WebVisu)
Programming system	CODESYS Development System (from version 3.5 SP4 patch 2)
Programming languages	FBD, SFC, CFC, IL, LD, ST
Available memory for PLC applications / RETAIN variables	approx. 10 MB / 4072 bytes

8.3 以太网网络地址分配

14436

在以太网网络中，每一个 IP 地址必须都是独一无二的。

以下 IP 地址为内部网络而保留，因此不得作为参与者的地址： nnn.nnn.nnn.0 | nnn.nnn.nnn.255.

仅子网掩码相同且 IP 地址与子网掩码相同的网络参与者可相互通信。

规则：

如果部分子网掩码 = 255，相应的 IP 地址部分必须相同。

如果部分子网掩码 = 0，相应的 IP 地址部分必须不同。

如果子网掩码 = 255.255.255.0，则网络中可有 254 个相互通信的参与者。

如果子网掩码 = 255.255.0.0，则网络中可有 256x254 = 65 024 个相互通信的参与者。

在同一物理网络中，允许不同的参与者子网掩码。 他们构成不同的参与者群组，不可与拥有其他子网掩码的参与者群组通信。

如有疑问或问题，请联系您的系统管理员。

示例：

参与者 A IP 地址	参与者 A 子网掩码	参与者 B IP 地址	参与者 B 子网掩码	可否进行参与者通信？
192.168.82.247	255.255.255.0	192.168.82.10	255.255.255.0	是，可有 254 个参与者
192.168.82.**247**	255.255.255.0	192.168.82.**247**	255.255.255.0	否（IP 地址相同）
192.168.82.247	255.255.**255**.0	192.168.82.10	255.255.**0**.0	否（子网掩码不同）
192.168.**82**.247	255.255.255.0	192.168.**116**.10	255.255.255.0	否（IP 地址范围不同：82 vs. 116）
192.168.222.213	255.255.0.0	192.168.222.123	255.255.0.0	是，可有 65 024 个参与者
192.168.111.213	255.255.0.0	192.168.222.123	255.255.0.0	是，可有 65 024 个参与者
192.168.82.247	255.255.255.0	192.168.82.**0**	255.255.255.0	否； 整个网络受干扰，因为 IP 地址 xxx.xxx.xxx.0 是不允许的

8.4 Configuration interface: connection concepts

内容

7071

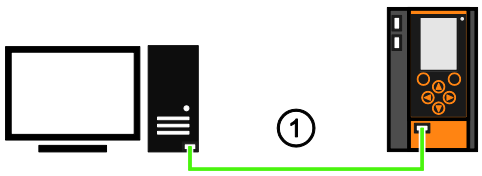
To be able to access the web interface and the programming interface of the device-internal PLC, the configuration interface (X3) must be connected to a computer. The device supports the following connection types:

- Direct connection (→ **Direct link** (→ 页 150))
- Connection via an EtherNet network (→ **Connection via Ethernet network** (→ 页 151))

8.4.1 Direct link

12551

To establish a direct connection to the device:



1	► Connect configuration interface X3 of the device with the Ethernet interface of the PC/laptop. ► Setup the IP parameters of the configuration interface (X3) to enable communication between the device and the PC/Laptop. → **有关 IP 设定的注意事项** (→ 页 105) → **以太网网络地址分配** (→ 页 149) > Connection bewtween device and PC/Laptop is established.

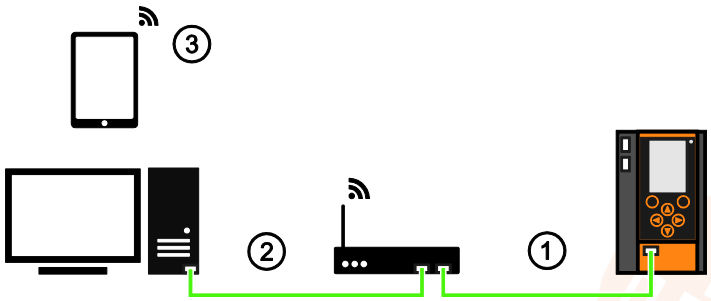
8.4.2 Connection via Ethernet network

12553

To establish a connection via a Ethernet network, the device has to be connected with a coupling element (e.g. Ethernet switch, WLAN router).

Option 1: Transmit fieldbus and web interface data via different networks

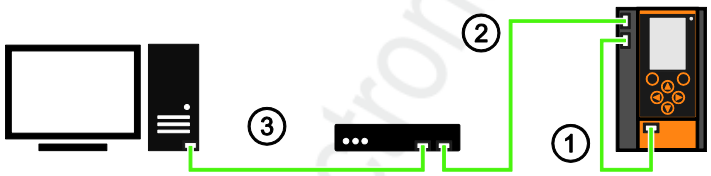
14182



1	► Enable DHCP functionality of the Ethernet switch/WLAN router. ► Connect configuration interface (X3) via Ethernet cable with the Ethernet switch/WLAN router (► Activate [Optain IP address autom.] (→ **有关 IP 设定的注意事项** (→ 页 105)). ► If required, activate the option 'Obtain an IP address automatically' in the IP settings of the PC.
2	► Connect PC/laptop with the Ethernet switch. OR:
3	► Connect PC/laptop wireless with the WLAN router . > Connection between device and PC/laptop is established.

Option 2: transfer fieldbus and web interface data over the same network

14183



1	► Connect the configuration interface (X3) to the Profinet interface (X7) using an EtherNet cable. ► Activate the DHCP function of the EtherNet switch for automatic assignment of IP addresses.
2	► Connect the Profinet interface (X6) to the EtherNet switch using an EtherNet cable. ► The parameter [Optain IP address autom.] must be activated (→ **有关 IP 设定的注意事项** (→ 页 105)).
3	► Connect the PC/laptop to the EtherNet switch using an EtherNet cable. ► If necessary, activate the option [Optain IP address automatically] in the IP settings of the PC/laptop. > The device and the PC/laptop/mobile device are connected over the IP network.

8.5 AS-i master

内容

8900

Master = 处理总线的整体安排。 主站决定总线访问时间并定期→轮询从站。

8.5.1 Operating modes of the AS-i master

内容

2769

The AS-i master can be operated in one of the following operating modes:

Protected mode

14833

In the operating mode "Protected mode" (= normal mode), the AS-i master only communicates with AS-i slaves that are entered in the list of projected slaves (LPS) and where current and target configuration match.

The AS-i master automatically detects the following actions and signals a configuration error:

- an AS-i slave is added to the AS-i network (error message: Slave not projected)
- an AS-i slave is removed from the AS-i network (error message: Slave not present)

Optionally, the operator can activate/deactivate the following monitoring functions (→ **Set the monitoring functions of the AS-i master** (→ 页 65)):

• Automatic addressing:	When a defective slave is replaced, the AS-i master controls the addressing. The new AS-i slave obtains the same address as the old AS-i slave if the following conditions are met: ▪ The new AS-i slave has the address `0`. ▪ Both AS-i slaves have the same device profile.
• Double address recognition:	The AS-i master recognises whether one or several AS-i slaves have the same address (error message: Double address error).
• Earth-fault detection:	The AS-i master detects any earth faults.

In the operating mode "Protected mode", the operator can control the PLC applications stored on the device (start, stop, reset).

Projection mode

8381

In the operating mode "Projection mode", the AS-i master communicates with all AS-i slaves that are connected to the AS-i line and do not have the address 0. Missing AS-i slaves are not detected by the AS-i master.

In projection mode a projection adaptation can be carried out. The AS-i master reads the configuration data of all detected AS-i slaves and saves it permanently.

Switch operating modes

5487

The operator / programmer can switch the operating modes of the AS-i master as follows:

- per GUI / web interface (→ **设定 AS-i 主站的工作模式** (→ 页 63))
- per function block `Set_Mode` (programming manual: → **Set_Mode**)

If an AS-i slave with the address 0 is connected, then the AS-i master cannot switch from "projection mode" into "protected mode" !

► Address the AS-i slave correctly.

► Switch the operating mode.

8.5.2 Master flags

内容

15944

The master flags contain information about the status of the AS-i master and the fieldbus host.
The master flags are transmitted along with the input data of the digital AS-i slaves in the acyclic data set DS2 (→ **DS2 – Digital inputs of the slaves and master flags** (→ 页 197)).

AS-i master status flags

10685

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: 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 1 = wait for configuration 2 = wait for start
2 = reserved	–
3 = offline phase	–
4 = detection phase	–
5 = activation phase	–
6 = normal operation	0 = normal data exchange 1 = slave finder activated

Execution control flags

10687

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) Exception: 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 (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): 1 (TRUE):	Master in protected mode Master in projection mode	0 (FALSE)
NOA	Normal_Operation_Active	1 (TRUE):	Master is in the normal mode (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): 1 (TRUE):	AS-i voltage OK AS-i voltage too low	1 (TRUE)
OR	Offline_Ready	1 (TRUE):	Master has gone through the offline phase and waits for: 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 (Echo of Set_Auto_Address_Enable of host)	0 (FALSE)
DEA	Data_Exchange_Active	1 (TRUE): 0 (FALSE):	Data exchange between master and slaves activated (reflects DEA of host flags) Instead of the data exchange, ReadID is continually executed on the slaves.	1 (TRUE)
PE	Protocol Error	1 (TRUE): 0 (FALSE):	CTT protocol error 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. (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: – change to protected mode – change of PCD – change of LPS – change of PCCD	0 (FALSE)
		0 (FALSE):	The master goes through the offline phase when changing to the protected mode the next time.	

Host flags

10689

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)

DAE/EE flags

10691

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): 0 (FALSE):	Double address detection is on. Double address detection is off.	0 (FALSE)
EE active	Earth fault detection is active	1 (TRUE): 0 (FALSE):	Earth fault detection is on. Earth fault detection is off.	1 (TRUE)

8.6 AS-i slaves

内容

8893

Slave = 总线上的被动参与者，仅依赖→主站的请求。 在总线中，从站有明确定义且唯一的→地址。

8.6.1 Profiles of AS-i slaves

内容

8902

Configuration data (CDI) of the slaves (slave profiles)

内容

5346

The configuration data CDI (= **C**onfiguration **D**ata **I**mage) for single, A and B slaves is stored in a data word. The structure is shown below and is the same for all slaves.

Structure of the slave profile

5347

The slave profile has the following structure: S-[IO code].[ID code].[ext. ID code2]

Bits 15...12	Bits 11...8	Bits 7...4	Bits 3...0
XID2 extended ID code 2 3rd figure in the slave profile (AS-i slave v2.0 = 0xF *)	XID1 extended ID code 1 is no part of the slave profile can be changed by the user (AS-i slave v2.0 = 0xF *)	ID code ID code 2nd figure in the slave profile	IO code I/O configuration 1st figure in the slave profile
Example:	AC2255 4 digital inputs, 2 digital outputs AS-i profile = S-7.A.E This results in the following configuration data of the slave:		
0b1110 = 0xE	(e.g.) 0b0111 = 0x7	0b1010 = 0xA	0b0111 = 0x7
The corresponding CDI data word is: 11100111 10100111 = 0xE7A7			

*) AS-i slaves according to the AS-i specification 2.0 and older do not support the extended ID codes 1 and 2. In the master 0xF is stored for this configuration data.

Description of the IO code for digital slaves

5349

Structure slave profile = S-[IO-Code].x.x

IO code [hex]	IO code (bits 3…0)	Function of the periphery bit			
		D3	D2	D1	D0
0	0000	input	input	input	input
1	0001	output	input	input	input
2	0010	input / output	input	input	input
3	0011	output	output	input	input
4	0100	input / output	input / output	input	input
5	0101	output	output	output	input
6	0110	input / output	input / output	input / output	input
7	0111	input / output	input / output	input / output	input / output
8	1000	output	output	output	output
9	1001	input	output	output	output
A	1010	input / output	output	output	output
B	1011	input	input	output	output
C	1100	input / output	input / output	output	output
D	1101	input	input	input	output
E	1110	input / output	input / output	input / output	output
F	1111	not allowed			

Description of the ID code (selection)

5351

Structure slave profile = S-x.[ID-Code].x

ID code [hex]	ID code (Bits 3…0)	Description
0	0000	4 I/O connections for binary sensors and/or actuators with 1 signal each
1	0001	2 dual-signal I/O connections for binary sensors and/or actuators with 2 signals each
A	1010	slave operates in the extended addressing mode (B slave or A/B slave)
B	1011	slave corresponds to Safety-at-Work
F	1111	manufacturer-specific device (cannot be replaced with products from other manufacturers)

Description of the extended ID code 1

5353

Can be changed by the user, however not a part of the slave profile.

Default value:
0xF for single slaves
0x7 for A/B slaves

The value is evaluated and checked by the master. The user can make an additional distinction between slaves which do not differ in the AS-i system, e.g. slaves with different ranges for current, voltage or frequency. This prevents damage when replacing slaves with a wrong performance range.

Description of the extended ID code 2

5355

Extended ID code 2 for analogue slaves with profile 7.3.x

5357

The extended ID code 2 is used to specify complex slaves.

Structure slave profile = S-7.3.[ext.ID code2]

Bit 3	Bit 2	Bit 1	Bit 0	Description
		0	0	1-channel slave
		0	1	2-channel slave
		1	0	4-channel slave
		1	1	4-channel slave (if slave has no extended ID code)
	0			transparent data exchange = binary bits
	1			analogue value transmission
0				output slave
1				input slave

The ID code 2 results from a combination of the options stated above.

Extended ID code 2 for analogue slaves with profile 7.4.x

5358

The extended ID code 2 is used to specify complex slaves.
Structure slave profile = S-7.3.[ext. ID code2]

Bit 3	Bit 2	Bit 1	Bit 0	Description
		0	0	1-channel slave
		0	1	2-channel slave
		1	0	4-channel slave
		1	1	4-channel slave (if slave has no extended ID code)
0	0	0	0	4 binary inputs + 4 binary outputs
0				output slave
1				input slave

The ID code 2 results from a combination of the options stated above.

Valid combinations IO code / ID code / extended ID code 2

5359

Structure slave profile = S-[IO code].[ID code].[ext. ID code2]

IO code [hex]	ID code [hex]	Ext. ID code 2 [hex]	Meaning
0…E not: 9, B, D	0	x	binary I/O connections for sensors and actuators
0, 3, 8	1	x	1 or 2 binary sensors or actuators with 2 signals each (dual-signal devices)
0	1	x	4 binary inputs for 2 dual-signal sensors
0…E not: 2A	A	x	slave operates in the "extended addressing mode" (B slave or A/B slave)
0	A	E	slave with extended address function: 4 binary inputs for 2 dual-signal sensors (e.g. I/O module AC2250)
0	B	x	slave corresponds to Safety-at-Work
0…E	F	x	manufacturer-specific device (cannot be replaced by other products)
1	1	x	single sensor with remote setting: 3 binary inputs + 1 binary output (e.g. sensor OC5226)
3	1	x	2 binary inputs for 1 dual-signal sensor AND 2 binary outputs for 1 dual-signal actuator
3	A	x	slave with extended address function
3	A	1	slave with extended address function: 2 binary inputs + 1 binary output
3	A	2	slave with extended address function: 4 binary inputs
6	0	x	quick combined transaction type 5 of 8, 12 or 16 data bits by using 2, 3 or 4 slave addresses in a slave
7	0	F	motor starter 2I + 2O (e.g. ZB0032)
7	0	E	4 binary inputs + 4 binary outputs (e.g. I/O module AC2251)
7	1	x	interface for the transmission of 6...18-bit signals; analogue profile for combined transaction type 1; was replaced by S-7.3
7	2	x	extended slave profile for the transmission of 6...18-bit signals; extended analogue profile for combined transaction type 1; was replaced by S-7.4
7	3	x	slave profile for 16-bit transmission with integrated support in the master; integrated analogue profile for combined transaction type 1 (→ **Extended ID code 2 for analogue slaves with profile 7.3.x** (→ 页 165))
7	3	5	2 analogue outputs of 16 bits each (e.g. I/O module AC2618)
7	3	6	4 analogue outputs of 16 bits each (e.g. I/O module AC2518)
7	3	C	1 analogue input of 16 bits (e.g. sensor PPA020)
7	3	D	2 analogue inputs of 16 bits each (e.g. I/O module AC2616)
7	3	E	4 analogue inputs of 16 bits each (e.g. I/O module AC2516)
7	4	x	extended slave profile for 16-bit transmission with integrated support in the master; integrated extended analogue profile for combined transaction type 1 (→ **Extended ID code 2 for analogue slaves with profile 7.4.x** (→ 页 166))

IO code [hex]	ID code [hex]	Ext. ID code 2 [hex]	Meaning
7	4	C	RFID identification system for writing and reading RFID tags 15-bit data + 1-bit messages (e.g. DTA100)
7	A	x	slave operates in the "extended addressing mode" (B slave or A/B slave)
7	A	5	slave operates in the "extended addressing mode" (B slave or A/B slave) combined slave; supports combined transaction type 2
7	A	7	slave operates in the "extended addressing mode" (B slave or A/B slave) 4 binary inputs + 4 binary outputs
7	A	8	slave operates in the "extended addressing mode" (B slave or A/B slave) 1 channel for combined transaction type 4
7	A	9	slave operates in the "extended addressing mode" (B slave or A/B slave) dual channel for combined transaction type 4
7	A	A	slave operates in the "extended addressing mode" (B slave or A/B slave) 8 binary inputs + 8 binary outputs
7	A	E	slave operates in the "extended addressing mode" (B slave or A/B slave); dual sensor with actuator interface (e.g. sensor AC2317); 2 binary inputs + 2 binary outputs
7	B	x	safety slave with non-safe outputs
7	B	0	safety slave with non-safe outputs; 2 safe binary inputs (e.g. I/O module AC005S)
7	B	E	safety sensor with non-safe outputs; 2 safe binary inputs AND 2 safe binary outputs AND 2 non-safe (relay) outputs (e.g. I/O module AC009S)
7	D	x	device for motor control (electromechanical)
7	D	0	electromechanical motor control with open sub-profile
7	D	1	electromechanical direct starter
7	D	2	electromechanical reverser
7	D	3	electromechanical direct starter with brake
7	D	4	electromechanical reverser with brake
7	D	5	electromechanical direct starter with accessories
7	D	6	electromechanical reverser with accessories
7	E	x	device for motor control (electronic)
7	E	0	electronic motor control with open sub-profile
7	E	1	electronic direct starter
7	E	2	electronic reverser
7	E	3	electronic direct starter with brake
7	E	4	electronic reverser with brake
7	E	5	electronic direct starter with accessories
7	E	6	electronic reverser with accessories
8	1	x	4 binary outputs for 2 dual-signal actuators
B	1	x	dual-signal actuator with feedback: 2 binary outputs + 2 binary inputs
B	A	5	slave operates in the "extended addressing mode" (B slave or A/B slave); supports combined transaction type 2

IO code [hex]	ID code [hex]	Ext. ID code 2 [hex]	Meaning
B	A	E	slave operates in the "extended addressing mode" (B slave or A/B slave); 2 binary outputs + 2 binary inputs (e.g. AC2086 module)
D	1	x	single actuator with monitoring: 1 binary output + 3 binary inputs

x = any value (0...F)

Devices with M4 master profile enable connection of slaves with more than 4 digital inputs/outputs. The transmission is combined: Part of the data transmission is carried out via the digital bits D0...D3, another part via the "analogue" channels.

The more data is transmitted, the longer it takes until all data of a slave has been transmitted.
Cycle time single slave = 5 ms
Cycle time A/B slave (if address is only assigned to A or B slave) = 5 ms
Cycle time A/B slave (if address is assigned to A and B slave) = 10 ms
The cycle time for CTT transmission is a multiple of these values for individual data.

CTT = Combined Transaction Type

Slave profiles for slaves with combined transaction

5362

Structure slave profile = S-[IO-Code].[ID-Code].[ext.ID-Code2]

Slave profile	Master profile	Assignment analogue channels in the device		Bits D0…D3	Additional acyclic string data transaction	Combined transaction CTT
		Number of channels	Use analogue / digital			
S-6.0	M4	1 I **and** 1 O	2/3/4 x 4 binary inputs **and** 2/3/4 x 4 binary outputs	—	no	type 5
S-7.3	M3	1/2/4 I **or** 1/2/4 O	1/2/4 analogue inputs **or** 1/2/4 binary outputs	—	no	type 1
S-7.4	M3	1/2/4 I **or** 1/2/4 O	1/2/4 analogue inputs **or** 1/2/4 binary outputs	4 inputs **or** 4 outputs	yes	type 1
S-7.5.5	M4	0…4 I **and** 0…4 O	0…4 analogue inputs or < 65 binary inputs **and** 0…4 analogue outputs or < 65 binary outputs	2 inputs **and** 2 outputs	yes	type 2
S-7.A.5	M4	0…2 I **and** 0…2 O	0…2 analogue inputs or < 33 binary inputs **and** 0…2 analogue outputs or < 33 binary outputs	2 inputs **and** 1 output	yes	type 2
S-7.A.7	M4	—	—	4 inputs **and** 4 outputs	no	type 3
S-7.A.8	M4	1 I	1 analogue input **or** < 17 binary inputs	1 output	no	type 4
S-7.A.9	M4	2 I	2 analogue inputs **or** < 33 binary inputs	—	no	type 4
S-7.A.A	M4	1 I **and** 1 O	8 binary inputs **and** 8 binary outputs	—	no	type 3
S-B.A.5	M4	0…2 I **and** 0…2 O	0…2 analogue inputs or < 33 binary inputs **and** 0…2 analogue outputs or < 33 binary outputs	—	yes	type 2

Legend colour pattern:

binary inputs | binary outputs | analogue inputs | analogue outputs

Combined transaction – Use of analogue channels in the gateway depending on the slave profile

5366

Transaction	Slave profile	Slave type	Number channels	Analogue input channels					Analogue output channels				
				CH3	CH2	CH1	CH0	Trans.	CH3	CH2	CH1	CH0	Trans.
CTT5	6.0.x	S	1	–	–	–	b	–	–	–	–	b	–
	7.3.C	S	1	–	–	–	a	–	–	–	–	–	–
	7.3.D	S	2	–	–	a	a	–	–	–	–	–	–
	7.3.E	S	4	a	a	a	a	–	–	–	–	–	–
	7.3.4	S	1	–	–	–	–	–	–	–	–	a	–
	7.3.5	S	2	–	–	–	–	–	–	–	a	a	–
	7.3.6	S	4	–	–	–	–	–	a	a	a	a	–
	7.3.C	S	1	–	–	–	a	–	–	–	–	–	–
	7.3.D	S	2	–	–	a	a	–	–	–	–	–	–
	7.3.E	S	4	a	a	a	a	–	–	–	–	–	–
	7.3.4	S	1	–	–	–	–	–	–	–	–	a	–
	7.3.5	S	2	–	–	–	–	–	–	–	a	a	–
	7.3.6	S	4	–	–	–	–	–	a	a	a	a	–
	7.4.4	S	1	–	–	–	–	–	–	–	–	a	X
	7.4.5	S	2	–	–	–	–	–	–	–	a	a	X
	7.4.6	S	4	–	–	–	–	–	a	a	a	a	X
	7.4.C	S	1	–	–	–	a	X	–	–	–	–	–
	7.4.D	S	2	–	–	a	a	X	–	–	–	–	–
	7.4.E	S	4	a	a	a	a	X	–	–	–	–	–
CTT2	7.5.5	S	0…4	a b	a b	a b	a b	X	a b	a b	a b	a b	X
	7.A.5	A	0…2	–	–	a b	a b	X	–	–	a b	a b	X
	7.A.5	B	0…2	a b	a b	–	–	X	a b	a b	–	–	X
		A	–					–					–
		B	–					–					–
		A	1	–	–	–	a b	–	–	–	–	–	–
		B	1	–	a b	–	–	–	–	–	–	–	–
		A	2	–	–	a b	a b	–	–	–	–	–	–
		B	2	a b	a b	–	–	–	–	–	–	–	–
		A	1	–	–	–	b	–	–	–	–	b	–
		B	1	–	b	–	–	–	–	b	–	–	–
	B.A.5	A	0…2	–	–	a b	a b	X	–	–	a b	a b	X
	B.A.5	B	0…2	a b	a b	–	–	X	a b	a b	–	–	X

CHn = channel
Trans. = transparent mode

S = single slave
A = A slave
B = B slave

a = analogue inputs/outputs (word)
b = binary inputs/outputs (bits)
– = not used

X = additional acyclic transaction of strings for device, parameters, diagnosis

Legend colour pattern:

8.7 Fieldbus Profinet

8896

PROFINET (**Pro**cess **Fi**eld **Net**work) is the open Industrial Ethernet Standard of Profibus & Profinet International (PI) for automation. Profinet uses TCP/IP and IT standards, is real-time Ethernet compatible and enables the integration of fieldbus systems.

The Profinet concept has a modular design, so that the user can choose the functionality himself. This is basically different as regards the type of data exchange, to meet the requirements regarding the speed.

For Profinet, there are the two perspectives Profinet-CBA and Profinet-IO:

- Profinet-CBA (Component Based Automation) is intended for the component-based communication via TCP/IP and the real-time communication for real-time requirements in modular plant construction. Both ways of communication can be used in parallel.
- Profinet-IO has been created for real-time (RT) and synchronous communication IRT (IRT = isochronous real-time) with the decentralised periphery. The designations RT and IRT only describe the real-time characteristics in the communication within Profinet-IO.

- → www.profibus.com (umbrella organisation)

8.7.1 Fieldbus parameters

17999

The fieldbus parameters provide information for the integration of the device into the Profinet network. The fieldbus parameters are set directly on the device.

Parameter	Meaning	Value range
IP address	IP address (IPv4) of the device's Profinet interface	e.g.: 192.168.0.200
Subnet mask	Subnet mask of the Profinet network segment	e.g.: 255.255.255.0
Gateway address	IP address (IPv4) of the Profinet gateway	e.g.: 192.168.0.100

8.7.2 Parameter data

9140

The parameter data enable an individual setting of the system. The parameter data is set via slot 0 of the system.

In the Siemens Step7 configuration tool "HW-Config." the parameter data is accessed by double-click on slot 0 of the device. All necessary settings can be made in the tab [Parameters].

Parameters: Compact Mode

10865

Parameter	Description	Value range	
		4 channels* =	4 channels (Variable slave assignment)
		2 channels =	2 channels (Fixed slave assignment)
		1 channel =	1 channel (Fixed slave assignment)
		4 channels* =	4 channels (Variable slave assignment)
		2 channels =	2 channels Fixed slave assignment)
		1 channel =	1 channel (Fixed slave assignment)
1. analogue input slave … 31. analog input slave	Assignment of the AS-i slave address to a position in the analogue input data image. Condition: Parameter [Analog channels per input slave] = 4 channels For each AS-i analogue slave 4 words at data are reserved.	Slave 1 AS-i master 1* … Slave 15 AS-i master 1* Slave 17 AS-i master 1 … Slave 31 AS-i master 1 Slave 1 AS-i master 2 … Slave 31 AS-i master 2	
1. analog output slave … 31. analog output slave	Assignment of the AS-i slave address to a position in the analogue output data image. Condition: Parameter [Analog channels per output slave] = 4 channels For each AS-i analogue slave 4 words of data are reserved.	Slave 1 AS-i master 1 … Slave 16 AS-i master 1 Slave 17 AS-i master 1* … Slave 31 AS-i master 1* Slave 1 AS-i master 2 … Slave 31 AS-i master 2	
		Clear outputs* =	All AS-i outputs are switched off in case of an interrupted Profinet connection (value = 0).
		Hold outputs =	The outputs are held in the last valid state that existed before the interrupted connection was detected.
		Disable =	The Profinetalarm data is NOT written to the AS-i system.
		Enable* =	The Profinet alarm data is written to the AS-i system.
		yes* =	Slave n+1 / slave n
		no =	Slave n / slave n+1

Parameter	Description	Value range	
AS-i param. download	Transmission of the slave parameters when downloading a configuration from the Profinet projection software.	Disable* =	The following slave parameter data are NOT downloaded to the device. The parameters set in the device apply.
		Enable =	Each time the Profinet connection is established, the following slave parameter data are downloaded to the device, activated in the AS-i slaves, and stored non-volatilely.
Param. slave 1(A) AS-i master 1 … Param. slave 31(A) AS-i master 1 Param. slave 1B AS-i master 1 … Param. slave 31B AS-i master 1 Param. slave 1(A) AS-i master 2 … Param. slave 31(A) AS-i master 2 Param. slave 1B AS-i master 2 … Param. slave 31B AS-i master 2	Parameter data of the AS-i slaves. The set values are only activated when the parameter "AS-i param. download" is set to the value "Enable".	P3..P0 = P3..P0 = … P3..P0** = … P3..P0* =	2#0000 / 16#0 2#0001 / 16#1 ... 2#0111 / 16#7 ... 2#1111 / 16#F

* ... Default setting for single slaves
** ... Default setting for A/B slaves

Parameters: Flexible mode

10891

Parameter	Description	Values	
		Clear outputs* =	All AS-i outputs are switched off in case of an interrupted Profinet connection (value = 0).
		Hold outputs =	The outputs are held in the last valid state that existed before the interrupted connection was detected.
		Disable =	The Profinetalarm data is NOT written to the AS-i system.
		Enable* =	The Profinet alarm data is written to the AS-i system.
		yes* =	Slave n+1 / slave n
		no =	Slave n / slave n+1
		Disable* =	The following slave parameter data are NOT downloaded to the device. The parameters set in the device apply.
		Enable =	Each time the Profinet connection is established, the following slave parameter data are downloaded to the device, activated in the AS-i slaves, and stored non-volatilely.
Param. slave 1(A) AS-i master 1 … Param. slave 31(A) AS-i master 1 Param. slave 1B AS-i master 1 … Param. slave 31B AS-i master 1 Param. slave 1(A) AS-i master 2 … Param. slave 31(A) AS-i master 2 Param. slave 1B AS-i master 2 … Param. slave 31B AS-i master 2	Parameter data of the AS-i slaves. The set values are only activated when the parameter "AS-i param. download" is set to the value "Enable".	P3..P0 = P3..P0 = … P3..P0** = … P3..P0* =	2#0000 / 16#0 2#0001 / 16#1 ... 2#0111 / 16#7 ... 2#1111 / 16#F

* ... Default setting
** ... Default setting for A/B slaves

GSDML file

7244

To represent the Profinet gateway in a fieldbus projection software (e.g. Siemens Step7) a GSDML file is provided.
The GSDML file for the ifm AS-i Profinet gateway AC140n is stored in the device and can be loaded to the configuration PC via the web interface (→ **下载 GSDML 文件** (→ 页 113)). All parameter and process data which is valid for the device is defined in the GSDML file.

On the Siemens Step7 object manager:
The object manager is part of the hardware configuration in Step7. It provides the device catalogue containing all devices which are available for projection. The catalogue consists of two parts. All non Siemens devices are listed in "Profinet – Further fieldbus devices". These devices are described using GSDML files which are imported into Step7.

8.7.3 Cyclic data

9005

The cyclic process data is, as the name suggests, cyclically updated via the fieldbus mechanisms.

For this, it must be defined in the fieldbus configuration which data with which lengths in which address areas of the host controller are to be used.

So-called slots contain each the process data of several AS-i slaves.

Profinet modules

8739

The following tables show the available Profinet modules in the flexible mode and in the compact mode.

Profinet modules: Flexible mode

9210

Slot	Description	Detailed information
1	Digital input/output data AS-i 主站 1 for single and A slaves	→ **Slot 1 – Digital inputs/outputs of single/A slaves, AS-i master 1** (→ 页 178)
2	Digital input/output data AS-i 主站 2 for single and A slaves	→ **Slot 2 – Digital inputs/outputs of single/A slaves, AS-i master 2** (→ 页 179)
3	Digital input/output data AS-i 主站 1 for B slaves	→ **Slot 3 – Digital inputs/outputs of B slaves, AS-i master 1** (→ 页 179)
4	Digital input/output data AS-i 主站 2 for B slaves	→ **Slot 4 – Digital inputs/outputs of B slaves, AS-i master 2** (→ 页 179)
7	Data from the device-internal PLC to the higher-level fieldbus PLC	→ **Slot 7 - Inputs from AC140n PLC** (→ 页 190)
8	Data of the higher-level fieldbus PLC to the device-internal PLC	→ **Slot 8 - Outputs to AC140n PLC** (→ 页 191)
101... 131*	Analogue data at AS-i 主站 1 can be configured via projection software at the Profinet-host)	
201... 231*	Analogue data at AS-i 主站 2 can be configured via projection software at the Profinet-host (only available for devices with 2 AS-i masters)	

* ... 1ss = AS-i master 1 ss = slave address
2ss = AS-i master 2

Profinet modules: Compact Mode

9209

Slot	Description	Detailed information
1	Digital input/output data AS-i 主站 1 for single and A slaves	→ **Slot 1 – Digital inputs/outputs of single/A slaves, AS-i master 1** (→ 页 178)
2	Digital input/output data AS-i 主站 2 for single and A slaves	→ **Slot 2 – Digital inputs/outputs of single/A slaves, AS-i master 2** (→ 页 179)
3	Digital input/output data AS-i 主站 1 for B slaves	→ **Slot 3 – Digital inputs/outputs of B slaves, AS-i master 1** (→ 页 179)
4	Digital input/output data AS-i 主站 2 for B slaves	→ **Slot 4 – Digital inputs/outputs of B slaves, AS-i master 2** (→ 页 179)
5	Analogue input data can be configured via device parameters (→ **Device-specific parameters** (→ 页 174))	→ **Slot 5 – analogue input data** (→ 页 182)
6	Analogue output data can be configured via device parameters (→ **Device-specific parameters** (→ 页 174))	→ **Slot 6 – analogue output data** (→ 页 183)
7	Data from the device-internal PLC to the higher-level fieldbus controller	→ **Slot 7 - Inputs from AC140n PLC** (→ 页 190)
8	Data of the higher-level fieldbus controller to the device-internal PLC	→ **Slot 8 - Outputs to AC140n PLC** (→ 页 191)

Slot 1 – Digital inputs/outputs of single/A slaves, AS-i master 1

8743

Slot	Description	Value range	Length [bytes]
		S/A slaves 01…07 AS-i 1 = S/A slaves 1 to 7 of AS-i 主站 1	4
		S/A slaves 01…15 AS-i 1 = S/A slaves 1 to 15 of AS-i 主站 1	8
		S/A slaves 01…23 AS-i 1 = S/A slaves 1 to 23 of AS-i 主站 1	12
		all S/A slaves AS-i 1 = all S/A slaves of AS-i 主站 1	16

In each 4-byte data block, the data of 8 AS-i slaves is transmitted (→ **Mapping of the digital input/output data** (→ 页 180)).

Slot 2 – Digital inputs/outputs of single/A slaves, AS-i master 2

8745

Slot	Description	Value range	Length [bytes]
		S/A slaves 01…07 AS-i 2 = S/A slaves 1 to 7 of AS-i 主站 2	4
		S/A slaves 01…15 AS-i 2 = S/A slaves 1 to 15 of AS-i 主站 2	8
		S/A slaves 01…23 AS-i 2 = S/A slaves 1 to 23 of AS-i 主站 2	12
		all S/A slaves AS-i 2 = all S/A slaves of AS-i 主站 2	16

In each 4-byte data block, the data of 8 AS-i slaves is transmitted (→ **Mapping of the digital input/output data** (→ 页 180)).

Slot 3 – Digital inputs/outputs of B slaves, AS-i master 1

8748

Slot	Description	Value range	Length [bytes]
		B-slaves 01…07 AS-i 1 = B slaves 1 to 7 of AS-i 主站 1	4
		B-slaves 01…15 AS-i 1 = B slaves 1 to 15 of AS-i 主站 1	8
		B-slaves 01…23 AS-i 1 = B slaves 1 to 23 of AS-i 主站 1	12
		all B slaves AS-i 1 = all B slaves of AS-i 主站 1	16

In each 4-byte data block, the data of 8 AS-i slaves is transmitted (→ **Mapping of the digital input/output data** (→ 页 180)).

Slot 4 – Digital inputs/outputs of B slaves, AS-i master 2

8749

Slot	Description	Value range	Length [bytes]
		B-slaves 01…07 AS-i 2 = B slaves 1 to 7 of AS-i 主站 2	4
		B-slaves 01…15 AS-i 2 = B slaves 1 to 15 of AS-i 主站 2	8
		B-slaves 01…23 AS-i 2 = B slaves 1 to 23 of AS-i 主站 2	12
		all B slaves AS-i 2 = all B slaves of AS-i 主站 2	16

In each 4-byte data block, the data of 8 AS-i slaves is transmitted (→ **Mapping of the digital input/output data** (→ 页 180)).

Mapping of the digital input/output data

1616

The following table shows in which area of a byte the input/output data of each slave are transmitted.

Byte no.	Bits 4...7	Bits 0...3	Content			
			S/A slaves 01...07 B slaves 01...07	S/A slaves 01...15 B slaves 01...15	S/A slaves 01...23 B slaves 01...23	all S/A slaves all B slaves
1	Master flags[1] Master flags	Slave 1(A) Slave 1B	X	X	X	X
2	Slave 2(A) Slave 2B	Slave 3(A) Slave 3B	X	X	X	X
3	Slave 4(A) Slave 4B	Slave 5(A) Slave 5B	X	X	X	X
4	Slave 6(A) Slave 6B	Slave 7(A) Slave 7B	X	X	X	X
5	Slave 8(A) Slave 8B	Slave 9(A) Slave 9B		X	X	X
6	Slave 10(A) Slave 10B	Slave 11(A) Slave 11B		X	X	X
7	Slave 12(A) Slave 12B	Slave 13(A) Slave 13B		X	X	X
8	Slave 14(A) Slave 14B	Slave 15(A) Slave 15B		X	X	X
9	Slave 16(A) Slave 16B	Slave 17(A) Slave 17B			X	X
10	Slave 18(A) Slave 18B	Slave 19(A) Slave 19B			X	X
11	Slave 20(A) Slave 20B	Slave 21(A) Slave 21B			X	X
12	Slave 22(A) Slave 22B	Slave 23(A) Slave 23B			X	X
13	Slave 24(A) Slave 24B	Slave 25(A) Slave 25B				X
14	Slave 26(A) Slave 26B	Slave 27(A) Slave 27B				X
15	Slave 28(A) Slave 28 B	Slave 29(A) Slave 29B				X
16	Slave 30(A) Slave 30B	Slave 31(A) Slave 31B				X

Legend:

[1] ... The master flags (M flags) are only transmitted in the digital input data (→ **Table: Master flags** (→ 页 181)).

Table: Master flags

8744

Bits 4...7 of the first byte of the digital input data contain the master flags. They provide information on the operating state of the AS-i master.

Bit 7	Bit 6	Bit 5	Bit 4
AS-i power fail (19 V)	Configuration error in the AS-i system	AS-i master is offline	Periphery fault

In the digital output data, bits 4...7 have no relevance and are not evaluated!

Slot 5 – Analogue input data

8750

Slot	Description	Value range	Length [Words]
		No analogue IN = module is disabled	0
		004 words = 4 words analogue inputs	4
		008 words = 8 words analogue inputs	8
		012 words = 12 words analogue inputs	12
		016 words = 16 words analogue inputs	16
		020 words = 20 words analogue inputs	20
		024 words = 24 words analogue inputs	24
		028 words = 28 words analogue inputs	28
		032 words = 32 words analogue inputs	32
		036 words = 36 words analogue inputs	36
		040 words = 40 words analogue inputs	40
		044 words = 44 words analogue inputs	44
		048 words = 48 words analogue inputs	48
		052 words = 52 words analogue inputs	52
		056 words = 56 words analogue inputs	56
		060 words = 60 words analogue inputs	60
		076 words = 76 words analogue inputs	76
		092 words = 92 words analogue inputs	92
		108 words = 108 words analogue inputs	108
		124 words = 124 words analogue inputs	124

In each word, the 16 bit value of the analogue channel is transferred (→ **Configuration of the analogue channels in the slots 5 ... 6** (→ 页 184)).

The `valid` and `overflow` flags which each analogue AS-i input slaves provides for each channel are NOT represented here.

Slot 6 – Analogue output data

8751

Slot	Description	Value range	Length [Words]
		No analogue outputs = module is disabled	0
		004 words = 4 words analogue outputs	4
		008 words = 8 words analogue outputs	8
		012 words = 12 words analogue outputs	12
		016 words = 16 words analogue outputs	16
		020 words = 20 words analogue outputs	20
		024 words = 24 words analogue outputs	24
		028 words = 28 words analogue outputs	28
		032 words = 32 words analogue outputs	32
		036 words =36 words analogue outputs	36
		040 words = 40 words analogue outputs	40
		044 words = 44 words analogue outputs	44
		048 words = 48 words analogue outputs	48
		052 words = 52 words analogue outputs	52
		056 words = 56 words analogue outputs	56
		060 words = 60 words analogue outputs	60
		076 words = 76 words analogue outputs	76
		092 words = 92 words analogue outputs	92
		108 words = 108 words analogue outputs	108
		124 words = 124 words analogue outputs	124

In each word, the 16 bit value of the analogue channel is transferred (→ **Configuration of the analogue channels in the slots 5 ... 6** (→ 页 184)).

Configuration of the analogue channels in the slots 5 ... 6

11028

The configuration of the device parameters [analogue channels per input slave] und [analogue channels per output slave] determines which analogue channels of the AS-i slaves are transferred. The following table shows the relevance of the parameter values that can be set:

Parameter value	Description
`1 channel`	**Fixed slave assignment** The first channel of the slave addresses 1 to 30 of AS-i 主站 1 and AS-i 主站 2 is transmitted. The assignment of the slaves is fixed (→ **Table: Fixed slave assignment for slots 5...6** (→ 页 185)). A configuration of the slave order in the device-specific parameters is ineffective.
`2 channels`	**Fixed slave assignment** Channels 1 and 2 of the slave addresses 1 to 31 of AS-i 主站 1 and AS-i 主站 2 are transmitted. The assignment of the slaves is fixed (→ **Table: Fixed slave assignment for slots 5...6** (→ 页 185)). A configuration of the slave order in the device-specific parameters is ineffective.
`4 channels`	**Variable slave assignment** From up to 31 slaves of AS-i 主站 1 and/or AS-i 主站 2 4 channels each (with 16 bits each) are transferred with analogue data (→ **Table: Variable slave assignment for channels 5...6** (→ 页 188)). Selection of the slaves to be transmitted via the following device parameters: - input data: `x. Analogue input slave` - output data: `x. Analogue output slave`

Table: Fixed slave assignment for slots 5...6

9025

The following table shows all possible combinations of data for the parameters:

- `Analogue channels per input slave = 1`
- `Analogue channels per input slave = 2`
- `Analogue channels per output slave = 1`
- `Analogue channels per output slave = 2`

Word	Setting of the device parameters	
	1 channel	2 channels
1	AS-i master 1 / slave 1(A) / channel 1	AS-i master 1 / slave 1(A) / channel 1
2	AS-i master 1 / slave 2(A) / channel 1	AS-i master 1 / slave 1(A) / channel 2
3	AS-i master 1 / slave 3(A) / channel 1	AS-i master 1 / slave 2(A) / channel 1
4	AS-i master 1 / slave 4(A) / channel 1	AS-i master 1 / slave 2(A) / channel 2
5	AS-i master 1 / slave 5(A) / channel 1	AS-i master 1 / slave 3(A) / channel 1
6	AS-i master 1 / slave 6(A) / channel 1	AS-i master 1 / slave 3(A) / channel 2
7	AS-i master 1 / slave 7(A) / channel 1	AS-i master 1 / slave 4(A) / channel 1
8	AS-i master 1 / slave 8(A) / channel 1	AS-i master 1 / slave 4(A) / channel 2
9	AS-i master 1 / slave 9(A) / channel 1	AS-i master 1 / slave 5(A) / channel 1
10	AS-i master 1 / slave 10(A) / channel 1	AS-i master 1 / slave 5(A) / channel 2
11	AS-i master 1 / slave 11(A) / channel 1	AS-i master 1 / slave 6(A) / channel 1
12	AS-i master 1 / slave 12(A) / channel 1	AS-i master 1 / slave 6(A) / channel 2
13	AS-i master 1 / slave 13(A) / channel 1	AS-i master 1 / slave 7(A) / channel 1
14	AS-i master 1 / slave 14(A) / channel 1	AS-i master 1 / slave 7(A) / channel 2
15	AS-i master 1 / slave 15(A) / channel 1	AS-i master 1 / slave 8(A) / channel 1
16	AS-i master 1 / slave 16(A) / channel 1	AS-i master 1 / slave 8(A) / channel 2
17	AS-i master 1 / slave 17(A) / channel 1	AS-i master 1 / slave 9(A) / channel 1
18	AS-i master 1 / slave 18(A) / channel 1	AS-i master 1 / slave 9(A) / channel 2
19	AS-i master 1 / slave 19(A) / channel 1	AS-i master 1 / slave 10(A) / channel 1
20	AS-i master 1 / slave 20(A) / channel 1	AS-i master 1 / slave 10(A) / channel 2
21	AS-i master 1 / slave 21(A) / channel 1	AS-i master 1 / slave 11(A) / channel 1
22	AS-i master 1 / slave 22(A) / channel 1	AS-i master 1 / slave 11(A) / channel 2
23	AS-i master 1 / slave 23(A) / channel 1	AS-i master 1 / slave 12(A) / channel 1
24	AS-i master 1 / slave 24(A) / channel 1	AS-i master 1 / slave 12(A) / channel 2
25	AS-i master 1 / slave 25(A) / channel 1	AS-i master 1 / slave 13(A) / channel 1
26	AS-i master 1 / slave 26(A) / channel 1	AS-i master 1 / slave 13(A) / channel 2
27	AS-i master 1 / slave 27(A) / channel 1	AS-i master 1 / slave 14(A) / channel 1
28	AS-i master 1 / slave 28(A) / channel 1	AS-i master 1 / slave 14(A) / channel 2
29	AS-i master 1 / slave 29(A) / channel 1	AS-i master 1 / slave 15(A) / channel 1
30	AS-i master 1 / slave 30(A) / channel 1	AS-i master 1 / slave 15(A) / channel 2
31	AS-i master 2 / slave 1(A) / channel 1	AS-i master 1 / slave 16(A) / channel 1

Word	Setting of the device parameters	
	1 channel	2 channels
32	AS-i master 2 / slave 2(A) / channel 1	AS-i master 1 / slave 16(A) / channel 2
33	AS-i master 2 / slave 3(A) / channel 1	AS-i master 1 / slave 17(A) / channel 1
34	AS-i master 2 / slave 4(A) / channel 1	AS-i master 1 / slave 17(A) / channel 2
35	AS-i master 2 / slave 5(A) / channel 1	AS-i master 1 / slave 18(A) / channel 1
36	AS-i master 2 / slave 6(A) / channel 1	AS-i master 1 / slave 18(A) / channel 2
37	AS-i master 2 / slave 7(A) / channel 1	AS-i master 1 / slave 19(A) / channel 1
38	AS-i master 2 / slave 8(A) / channel 1	AS-i master 1 / slave 19(A) / channel 2
39	AS-i master 2 / slave 9(A) / channel 1	AS-i master 1 / slave 20(A) / channel 1
40	AS-i master 2 / slave 10(A) / channel 1	AS-i master 1 / slave 20(A) / channel 2
41	AS-i master 2 / slave 11(A) / channel 1	AS-i master 1 / slave 21(A) / channel 1
42	AS-i master 2 / slave 12(A) / channel 1	AS-i master 1 / slave 21(A) / channel 2
43	AS-i master 2 / slave 13(A) / channel 1	AS-i master 1 / slave 22(A) / channel 1
44	AS-i master 2 / slave 14(A) / channel 1	AS-i master 1 / slave 22(A) / channel 2
45	AS-i master 2 / slave 15(A) / channel 1	AS-i master 1 / slave 23(A) / channel 1
46	AS-i master 2 / slave 16(A) / channel 1	AS-i master 1 / slave 23(A) / channel 2
47	AS-i master 2 / slave 17(A) / channel 1	AS-i master 1 / slave 24(A) / channel 1
48	AS-i master 2 / slave 18(A) / channel 1	AS-i master 1 / slave 24(A) / channel 2
49	AS-i master 2 / slave 19(A) / channel 1	AS-i master 1 / slave 25(A) / channel 1
50	AS-i master 2 / slave 20(A) / channel 1	AS-i master 1 / slave 25(A) / channel 2
51	AS-i master 2 / slave 21(A) / channel 1	AS-i master 1 / slave 26(A) / channel 1
52	AS-i master 2 / slave 22(A) / channel 1	AS-i master 1 / slave 26(A) / channel 2
53	Master 2 / slave 23(A) / channel 1	AS-i master 1 / slave 27(A) / channel 1
54	AS-i master 2 / slave 24(A) / channel 1	AS-i master 1 / slave 27(A) / channel 2
55	AS-i master 2 / slave 25(A) / channel 1	AS-i master 1 / slave 28(A) / channel 1
56	AS-i master 2 / slave 26(A) / channel 1	AS-i master 1 / slave 28(A) / channel 2
57	AS-i master 2 / slave 27(A) / channel 1	AS-i master 1 / slave 29(A) / channel 1
58	AS-i master 2 / slave 28(A) / channel 1	AS-i master 1 / slave 29(A) / channel 2
59	AS-i master 2 / slave 29(A) / channel 1	AS-i master 1 / slave 30(A) / channel 1
60	AS-i master 2 / slave 30(A) / channel 1	AS-i master 1 / slave 30(A) / channel 2
61	–	AS-i master 1 / slave 31(A) / channel 1
62	–	AS-i master 1 / slave 31(A) / channel 2
63	–	AS-i master 2 / slave 1(A) / channel 1
64	–	AS-i master 2 / slave 1(A) / channel 2
65	–	AS-i master 2 / slave 2(A) / channel 1
66	–	AS-i master 2 / slave 2(A) / channel 2
67	–	AS-i master 2 / slave 3(A) / channel 1
68	–	AS-i master 2 / slave 3(A) / channel 2
69	–	AS-i master 2 / slave 4(A) / channel 1
70	–	AS-i master 2 / slave 4(A) / channel 2

Word	Setting of the device parameters	
	1 channel	2 channels
71	–	AS-i master 2 / slave 5(A) / channel 1
72	–	AS-i master 2 / slave 5(A) / channel 2
73	–	AS-i master 2 / slave 6(A) / channel 1
74	–	AS-i master 2 / slave 6(A) / channel 2
75	–	AS-i master 2 / slave 7(A) / channel 1
76	–	AS-i master 2 / slave 7(A) / channel 2
77	–	AS-i master 2 / slave 8(A) / channel 1
78	–	AS-i master 2 / slave 8(A) / channel 2
79	–	AS-i master 2 / slave 9(A) / channel 1
80	–	AS-i master 2 / slave 9(A) / channel 2
81	–	AS-i master 2 / slave 10(A) / channel 1
82	–	AS-i master 2 / slave 10(A) / channel 2
83	–	AS-i master 2 / slave 11(A) / channel 1
84	–	AS-i master 2 / slave 11(A) / channel 2
85	–	AS-i master 2 / slave 12(A) / channel 1
86	–	AS-i master 2 / slave 12(A) / channel 2
87	–	AS-i master 2 / slave 13(A) / channel 1
88	–	AS-i master 2 / slave 13(A) / channel 2
89	–	AS-i master 2 / slave 14(A) / channel 1
90	–	AS-i master 2 / slave 14(A) / channel 2
91	–	AS-i master 2 / slave 15(A) / channel 1
92	–	AS-i master 2 / slave 15(A) / channel 2
93	–	AS-i master 2 / slave 16(A) / channel 1
94	–	AS-i master 2 / slave 16(A) / channel 2
95	–	AS-i master 2 / slave 17(A) / channel 1
96	–	AS-i master 2 / slave 17(A) / channel 2
97	–	AS-i master 2 / slave 18(A) / channel 1
98	–	AS-i master 2 / slave 18(A) / channel 2
99	–	AS-i master 2 / slave 19(A) / channel 1
100	–	AS-i master 2 / slave 19(A) / channel 2
101	–	AS-i master 2 / slave 20(A) / channel 1
102	–	AS-i master 2 / slave 20(A) / channel 2
103	–	AS-i master 2 / slave 21(A) / channel 1
104	–	AS-i master 2 / slave 21(A) / channel 2
105	–	AS-i master 2 / slave 22(A) / channel 1
106	–	AS-i master 2 / slave 22(A) / channel 2
107	–	AS-i master 2 / slave 23(A) / channel 1
108	–	AS-i master 2 / slave 23(A) / channel 2
109	–	AS-i master 2 / slave 24(A) / channel 1

Word	Setting of the device parameters	
	1 channel	2 channels
110	–	AS-i master 2 / slave 24(A) / channel 2
111	–	AS-i master 2 / slave 25(A) / channel 1
112	–	AS-i master 2 / slave 25(A) / channel 2
113	–	AS-i master 2 / slave 26(A) / channel 1
114	–	AS-i master 2 / slave 26(A) / channel 2
115	–	AS-i master 2 / slave 27(A) / channel 1
116	–	AS-i master 2 / slave 27(A) / channel 2
117	–	AS-i master 2 / slave 28(A) / channel 1
118	–	AS-i master 2 / slave 28(A) / channel 2
119	–	AS-i master 2 / slave 29(A) / channel 1
120	–	AS-i master 2 / slave 29(A) / channel 2
121	–	AS-i master 2 / slave 30(A) / channel 1
122	–	AS-i master 2 / slave 30(A) / channel 2
123	–	AS-i master 2 / slave 31(A) / channel 1
124	–	AS-i master 2 / slave 31(A) / channel 2

Table: Variable slave assignment for slots 5...6

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 1 = for setting 4 words ... 15 = for setting 60 words
x ...	1 = AS-i 主站 1 2 = AS-i 主站 2
m ...	Numeric part of the selected AS-i slave address

Slot 1ss/2ss – flex modules for analogue slaves

9211

In the Profinet-projection software, every single analogue input/output slave can be shown as separate slot. Here, the following areas apply:

- Slot 101...131 for analogue slaves at AS-i 主站 1
- Slot 201...232 for analogue slaves at AS-i 主站 2

In the flex module representation the first digit identifies the AS-i master the analogue slave is assigned to. The two following digits stand for the address of the analogue AS-i slave.

Example: Slot 223 = AS-i 主站 2, analogue slave with address 23

These slots can contain the following modules in any combination you choose:

Module name	Description		
	slave type	Channel no.	Slave input/output
1 Channel analogue input (single or A slave)	Single or A slave	0	
1 Channel analogue input (B slave)	B slave	0	
2 Channels analogue input (single or A slave)	Single or A slave	0 + 1	
2 Channels analogue input (B slave)	B slave	0 + 1	
4 Channels analogue input (single or A&B slave)	Single slave or: A slave B slave	0…3 0 + 1 0 + 1	
1 Channel analogue output (single or A slave)	single or A slave	0	
1 Channel analogue output (B slave)	B slave	0	
2 Channels analogue output (single or A slave)	Single or A slave	0 + 1	
2 Channels analogue output (B slave)	B slave	0 + 1	
4 Channels analogue output (single or A&B slave)	Single slave or: A slave B slave	0…3 0 + 1 0 + 1	
1 Channel bidirectional analogue (single or A slave)	Single or A slave	0	
1 Channel bidirectional analogue (B slave)	B slave	0	
2 Channels bidirectional analogue (single or A slave)	single or A slave	0 + 1	
2 Channels bidirectional analogue (B slave)	B slave	0 + 1	
4 Channels bidirectional analogue (single or A&B slave)	Single slave or: A slave B slave	0…3 0 + 1 0 + 1	

Slot 7 - Inputs from AC140n PLC

11018

Slot	Description	Value range	Length [Words]
		Empty module = module is deactivated	0
		004 words = 4 words from AC140n PLC to fieldbus PLC	4
		008 words = 8 words from AC140n PLC to fieldbus PLC	8
		012 words = 12 words from AC140n PLC to fieldbus PLC	12
		016 words = 16 words from AC140n PLC to fieldbus PLC	16
		020 words = 20 words from AC140n PLC to fieldbus PLC	20
		024 words = 24 words from AC140n PLC to fieldbus PLC	24
		028 words = 28 words from AC140n PLC to fieldbus PLC	28
		032 words = 32 words from AC140n PLC to fieldbus PLC	32
		036 words = 36 words from AC140n PLC to fieldbus PLC	36
		040 words = 40 words from AC140n PLC to fieldbus PLC	40
		044 words = 44 words from AC140n PLC to fieldbus PLC	44
		048 words = 48 words from AC140n PLC to fieldbus PLC	48
		052 words = 52 words from AC140n PLC to fieldbus PLC	52
		056 words = 56 words from AC140n PLC to fieldbus PLC	56
		060 words = 60 words from AC140n PLC to fieldbus PLC	60
		076 words = 76 words from AC140n PLC to fieldbus PLC	76
		092 words = 92 words from AC140n PLC to fieldbus PLC	92
		108 words = 108 words from AC140n PLC to fieldbus PLC	108
		120 words = 120 words from AC140n PLC to fieldbus PLC	120

Slot 8 - Outputs to AC140n PLC

11020

Slot	Description	Value range	Length [Words]
		Empty module = module is deactivated	0
		004 words = 4 words from fieldbus PLC to AC140n PLC	4
		008 words = 8 words from fieldbus PLC to AC140n PLC	8
		012 words = 12 words from fieldbus PLC to AC140n PLC	12
		016 words = 16 words from fieldbus PLC to AC140n PLC	16
		020 words = 20 words from fieldbus PLC to AC140n PLC	20
		024 words = 24 words from fieldbus PLC to AC140n PLC	24
		028 words = 28 words from fieldbus PLC to AC140n PLC	28
		032 words = 32 words from fieldbus PLC to AC140n PLC	32
		036 words = 36 words from fieldbus PLC to AC140n PLC	36
		040 words = 40 words from fieldbus PLC to AC140n PLC	40
		044 words = 44 words from fieldbus PLC to AC140n PLC	44
		048 words = 48 words from fieldbus PLC to AC140n PLC	48
		052 words = 52 words from fieldbus PLC to AC140n PLC	52
		056 words = 56 words from fieldbus PLC to AC140n PLC	56
		060 words = 60 words from fieldbus PLC to AC140n PLC	60
		076 words = 76 words from fieldbus PLC to AC140n PLC	76
		092 words = 92 words from fieldbus PLC to AC140n PLC	92
		108 words = 108 words from fieldbus PLC to AC140n PLC	108
		120 words = 120 words from fieldbus PLC to AC140n PLC	120

8.7.4 Acyclic data

9070

Acyclic data are transmitted via slot 0, subslot 1 (→ **Overview: Acyclic process data** (→ 页 192)).

The indices use the data structures of the following components:

- Acyclic data set (DS):
  → **Overview: Acyclic data sets (DSx)** (→ 页 195)
- Fieldbus command channel:
  → **Overview: System commands** (→ 页 223)
  → **Overview: AS-i master commands** (→ 页 242)

Overview: Acyclic process data

8752

The indices on slot 0, subslot 1, are used as follows:

Index [dec]	From byte no. [dec]	To byte no. [dec]	Contents	DS	Access r = read w = write	Number of words
0	–	–	reserved for system start	–	–	–
1	0	51	Read system information	DS1	r	26
21	0	242	Data from AC140n PLC to Profinet PLC	DS21	r	121
22	0	242	Data from Profinet PLC to AC140n PLC	DS22	r	121
30	0	239	System command request channel	–	r/w	120
31	0	239	System command reply channel	–	r	120
32	0	69	M1 digital slave inputs 1(A)…31(A) and 1B…31B (1 byte per slave) + M1 master flags (status AS-i master and exec.-ctl. flags and host flags)	DS2	r	35
33	0	149	M1 analogue slave inputs 1(A)…15(B)	DS3	r	75
34	0	159	M1 analogue slave inputs 16(A)…31(B)	DS4	r	80
35	0	63	M1 digital slave outputs 1(A)…31(A) and 1B…31B (1 byte per slave)	DS5	r/w	32
36	0	119	M1 analogue slave outputs 1(A)…15(B)	DS6	r/w	60
37	0	127	M1 analogue slave outputs 16(A)…31(B)	DS7	r/w	64
38	0	63	M1 status flags analogue outputs 1(A)…31(A) and 1B…31B	DS8	r	32
39	0	31	M1 LAS, LDS, LPF, LCE	DS9	r	16
40	0	7	M1 LPS	DS10	r	4
41	0	127	M1 current configuration data (CDI)	DS11	r	64
42	0	127	M1 projected configuration data (PCD)	DS12	r	64
43	0	63	M1 input parameter image (1 byte per slave)	DS13	r	32
44	0	63	M1 output parameter image (1 byte per slave)	DS14	r/w	32
46	0	143	M1 slave error counter, configuration error counter, AS-i cycle counter	DS15	r	72
47	0	23	M1 LCEMS, LCEAS, LDAE	DS17	r	12
48	0	740	M1 Error distribution frame errors	DS20	r	370

Index [dec]	From byte no. [dec]	To byte no. [dec]	Contents	DS	Access r = read w = write	Number of words
62	0	239	M1 command request channel	–	r/w	120
63	0	239	M1 command reply channel	–	r	120
64	0	69	M2 digital slave inputs 1(A)…31(A) and 1B…31B (1 byte per slave) + M2 master flags (status AS-i master and exec.-ctl. flags and host flags)	DS2	r	35
65	0	149	M2 analogue slave inputs 1(A)…15(B)	DS3	r	75
66	0	159	M2 analogue slave inputs 16(A)…31(B)	DS4	r	80
67	0	63	M2 digital slave outputs 1(A)…31(A) and 1B…31B (1 byte per slave)	DS5	r/w	32
68	0	119	M2 analogue slave outputs 1(A)…15(B)	DS6	r/w	60
69	0	127	M2 analogue slave outputs 16(A)…31(B)	DS7	r/w	64
70	0	63	M2 status flags analogue outputs 1(A)…31(A) and 1B…31B	DS8	r	32
71	0	31	M2 LAS, LDS, LPF, LCE	DS9	r	16
72	0	7	M2 LPS	DS10	r	4
73	0	127	M2 current configuration data (CDI)	DS11	r	64
74	0	127	M2 projected configuration data (PCD)	DS12	r	64
75	0	63	M2 input parameter image (1 byte per slave)	DS13	r	32
76	0	63	M2 output parameter image (1 byte per slave)	DS14	r/w	32
78	0	131	M2 slave error counter, configuration error counter, AS-i cycle counter	DS15	r	66
79	0	23	M2 LCEMS, LCEAS, LDAE	DS17	r	12
80	0	740	M2 Error distribution frame errors	DS20	r	370
94	0	239	M2 command request channel	–	r/w	120
95	0	239	M2 command reply channel	–	r	120

Legend:

DS = Acyclic data set (→ **Overview: Acyclic data sets (DSx)** (→ 页 195))
M1 = AS-i master 1
M2 = AS-i master 2

Acyclic data records

内容

10680

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

Overview: Acyclic data sets (DSx)

10645

Data set no.	Content	Access r = read w = write	Words
DS1	System information	r	26
DS2	Digital slave inputs 1(A)…31(A) and 1B…31B + master flags (status AS-i master and exec.-ctl. flags and host flags)	r	36
DS3	Analogue slave inputs 1(A)…15(B)	r	75
DS4	Analogue slave inputs 16(A)…31(B)	r	80
DS5	Digital slave outputs 1(A)…31(A) and 1B…31B	r/w	32
DS6	Analogue slave outputs 1(A)…15(B)	r/w	60
DS7	Analogue slave outputs 16(A)…31(B)	r/w	64
DS8	Status flags analogue outputs 1(A)…31(A) and 1B…31B	r	32
DS9	Slave lists LAS, LDS, LPF, LCE	r	16
DS10	Slave lists LPS	r	4
DS11	Current configuration data CDI	r	64
DS12	Projected configuration data PCD	r	64
DS13	Input parameter image	r	32
DS14	Input parameter image	r/w	32
DS15	Slave error counter, configuration error counter, AS-i cycle counter	r	72
DS16	n.a.	–	–
DS17	Error lists LCEMS, LCEAS, LDAE	r	12
DS18	Read fieldbus info (only available via CODESYS)	r	19
DS19	n.a.	–	–
DS20	Error distribution frame errors	r	370
DS21	Data from AC140n PLC to fieldbus PLC (PLCin)	r/w	121
DS22	Data from fieldbus> PLC to AC140n PLC (PLCout)	r	121

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]) PLC (byte 3, high byte)								Operating hours [5]) PLC (byte 2)							
17	Operating hours [5]) PLC (byte 1)								Operating hours [5]) 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	已保留								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 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. "AC140n"
[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

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	已保留				Slave 1(A): D3...D0				已保留				已保留			
1	已保留				Slave 3(A): D3...D0				已保留				Slave 2(A): D3...D0			
2	已保留				Slave 5(A): D3...D0				已保留				Slave 4(A): D3...D0			
3	已保留				Slave 7(A): D3...D0				已保留				Slave 6(A): D3...D0			
4	已保留				Slave 9(A): D3...D0				已保留				Slave 8(A): D3...D0			
5	已保留				Slave 11(A): D3...D0				已保留				Slave 10(A): D3...D0			
6	已保留				Slave 13(A): D3...D0				已保留				Slave 12(A): D3...D0			
7	已保留				Slave 15(A): D3...D0				已保留				Slave 14(A): D3...D0			
8	已保留				Slave 17(A): D3...D0				已保留				Slave 16(A): D3...D0			
9	已保留				Slave 19(A): D3...D0				已保留				Slave 18(A): D3...D0			
10	已保留				Slave 21(A): D3...D0				已保留				Slave 20(A): D3...D0			
11	已保留				Slave 23(A): D3...D0				已保留				Slave 22(A): D3...D0			
12	已保留				Slave 25(A): D3...D0				已保留				Slave 24(A): D3...D0			
13	已保留				Slave 27(A): D3...D0				已保留				Slave 26(A): D3...D0			
14	已保留				Slave 29(A): D3...D0				已保留				Slave 28(A): D3...D0			
15	已保留				Slave 31(A): D3...D0				已保留				Slave 30(A): D3...D0			
16	已保留				Slave 1B: D3...D0				已保留				已保留			
17	已保留				Slave 3B: D3...D0				已保留				Slave 2B: D3...D0			
18	已保留				Slave 5B: D3...D0				已保留				Slave 4B: D3...D0			
19	已保留				Slave 7B: D3...D0				已保留				Slave 6B: D3...D0			
20	已保留				Slave 9B: D3...D0				已保留				Slave 8B: D3...D0			
21	已保留				Slave 11B: D3...D0				已保留				Slave 10B: D3...D0			
22	已保留				Slave 13B: D3...D0				已保留				Slave 12B: D3...D0			
23	已保留				Slave 15B: D3...D0				已保留				Slave 14B: D3...D0			
24	已保留				Slave 17B: D3...D0				已保留				Slave 16B: D3...D0			
25	已保留				Slave 19B: D3...D0				已保留				Slave 18B: D3...D0			
26	已保留				Slave 21B: D3...D0				已保留				Slave 20B: D3...D0			
27	已保留				Slave 23B: D3...D0				已保留				Slave 22B: D3...D0			

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
28	已保留				Slave 25B: D3...D0				已保留				Slave 24B: D3...D0			
29	已保留				Slave 27B: D3...D0				已保留				Slave 26B: D3...D0			
30	已保留				Slave 29B: D3...D0				已保留				Slave 28B: D3...D0			
31	已保留				Slave 31B: D3...D0				已保留				Slave 30B: D3...D0			
32	AS-i master status flags (→ **AS-i master status flags** (→ 页 156))															
33	Execution control flags (→ **Execution control flags** (→ 页 157))															
34	Host flags (→ **Host flags** (→ 页 159))															
35	DAE / EE-Flags (→ **DAE/EE flags** (→ 页 160))															

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)															

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 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: 0 = slave transmits input data as a value (15 bits long, plus sign) 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: 0 = slave receives output data as a value (15 bits long, plus sign) 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 1 = values in channel n are valid Output data must be valid (Vn = 1) to be enabled in the AS-i slave!

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)															

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 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: 0 = slave transmits input data as a value (15 bits long, plus sign) 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: 0 = slave receives output data as a value (15 bits long, plus sign) 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 1 = values in channel n are valid Output data must be valid (Vn = 1) to be enabled in the AS-i slave!

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	已保留				slave 1(A): D3...D0				已保留				已保留			
1	已保留				Slave 3(A): D3...D0				已保留				Slave 2(A): D3...D0			
2	已保留				Slave 5(A): D3...D0				已保留				Slave 4(A): D3...D0			
3	已保留				Slave 7(A): D3...D0				已保留				Slave 6(A): D3...D0			
4	已保留				Slave 9(A): D3...D0				已保留				Slave 8(A): D3...D0			
5	已保留				Slave 11(A): D3...D0				已保留				Slave 10(A): D3...D0			
6	已保留				Slave 13(A): D3...D0				已保留				Slave 12(A): D3...D0			
7	已保留				Slave 15(A): D3...D0				已保留				Slave 14(A): D3...D0			
8	已保留				Slave 17(A): D3...D0				已保留				Slave 16(A): D3...D0			
9	已保留				Slave 19(A): D3...D0				已保留				Slave 18(A): D3...D0			
10	已保留				Slave 21(A): D3...D0				已保留				Slave 20(A): D3...D0			
11	已保留				Slave 23(A): D3...D0				已保留				Slave 22(A): D3...D0			
12	已保留				Slave 25(A): D3...D0				已保留				Slave 24(A): D3...D0			
13	已保留				Slave 27(A): D3...D0				已保留				Slave 26(A): D3...D0			
14	已保留				Slave 29(A): D3...D0				已保留				Slave 28(A): D3...D0			
15	已保留				Slave 31(A): D3...D0				已保留				Slave 30(A): D3...D0			
16	已保留				Slave 1B: D3...D0				已保留				已保留			
17	已保留				Slave 3B: D3...D0				已保留				Slave 2B: D3...D0			
18	已保留				Slave 5B: D3...D0				已保留				Slave 4B: D3...D0			
19	已保留				Slave 7B: D3...D0				已保留				Slave 6B: D3...D0			
20	已保留				Slave 9B: D3...D0				已保留				Slave 8B: D3...D0			
21	已保留				Slave 11B: D3...D0				已保留				Slave 10B: D3...D0			
22	已保留				Slave 13B: D3...D0				已保留				Slave 12B: D3...D0			
23	已保留				Slave 15B: D3...D0				已保留				Slave 14B: D3...D0			
24	已保留				Slave 17B: D3...D0				已保留				Slave 16B: D3...D0			
25	已保留				Slave 19B: D3...D0				已保留				Slave 18B: D3...D0			
26	已保留				Slave 21B: D3...D0				已保留				Slave 20B: D3...D0			
27	已保留				Slave 23B: D3...D0				已保留				Slave 22B: D3...D0			

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
28	已保留				Slave 25B: D3...D0				已保留				Slave 24B: D3...D0			
29	已保留				Slave 27B: D3...D0				已保留				Slave 26B: D3...D0			
30	已保留				Slave 29B: D3...D0				已保留				Slave 28B: D3...D0			
31	已保留				Slave 31B: D3...D0				已保留				Slave 30B: D3...D0			

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)															

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 1 = for setting 4 words ... 15 = for setting 60 words
x ...	1 = AS-i 主站 1 2 = AS-i 主站 2
m ...	Numeric part of the selected AS-i slave address

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)															

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 1 = for setting 4 words ... 15 = for setting 60 words
x ...	1 = AS-i 主站 1 2 = AS-i 主站 2
m ...	Numeric part of the selected AS-i slave address

DS8 – Status of the 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	已保留															
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	已保留							

Legend:

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

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															

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!

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															

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!

DS11 – Current 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	已保留															
33	Slave 1B															
...	...															
63	Slave 31B															

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	已保留															
1	Slave 1(A)															
2	Slave 2(A)															
...	...															
31	Slave 31(A)															
32	reserved															
33	Slave 1B															
...	...															
63	Slave 31B															

DS13 – Image of the input parameters of the slaves

8781

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	已保留				Slave 1(A): P3...P0				已保留				已保留			
1	已保留				Slave 3(A): P3...P0				已保留				Slave 2(A): P3...P0			
2	已保留				Slave 5(A): P3...P0				已保留				Slave 4(A): P3...P0			
3	已保留				Slave 7(A): P3...P0				已保留				Slave 6(A): P3...P0			
4	已保留				Slave 9(A): P3...P0				已保留				Slave 8(A): P3...P0			
5	已保留				Slave 11(A): P3...P0				已保留				Slave 10(A): P3...P0			
6	已保留				Slave 13(A): P3...P0				已保留				Slave 12(A): P3...P0			
7	已保留				Slave 15(A): P3...P0				已保留				Slave 14(A): P3...P0			
8	已保留				Slave 17(A): P3...P0				已保留				Slave 16(A): P3...P0			
9	已保留				Slave 19(A): P3...P0				已保留				Slave 18(A): P3...P0			
10	已保留				Slave 21(A): P3...P0				已保留				Slave 20(A): P3...P0			
11	已保留				Slave 23(A): P3...P0				已保留				Slave 22(A): P3...P0			
12	已保留				Slave 25(A): P3...P0				已保留				Slave 24(A): P3...P0			
13	已保留				Slave 27(A): P3...P0				已保留				Slave 26(A): P3...P0			
14	已保留				Slave 29(A): P3...P0				已保留				Slave 28(A): P3...P0			
15	已保留				Slave 31(A): P3...P0				已保留				Slave 30(A): P3...P0			
16	已保留				Slave 1B: P3...P0				已保留				已保留			
17	已保留				Slave 3B: P3...P0				已保留				Slave 2B: P3...P0			
18	已保留				Slave 5B: P3...P0				已保留				Slave 4B: P3...P0			
19	已保留				Slave 7B: P3...P0				已保留				Slave 6B: P3...P0			
20	已保留				Slave 9B: P3...P0				已保留				Slave 8B: P3...P0			
21	已保留				Slave 11B: P3...P0				已保留				Slave 10B: P3...P0			
22	已保留				Slave 13B: P3...P0				已保留				Slave 12B: P3...P0			
23	已保留				Slave 15B: P3...P0				已保留				Slave 14B: P3...P0			
24	已保留				Slave 17B: P3...P0				已保留				Slave 16B: P3...P0			
25	已保留				Slave 19B: P3...P0				已保留				Slave 18B: P3...P0			
26	已保留				Slave 21B: P3...P0				已保留				Slave 20B: P3...P0			
27	已保留				Slave 23B: P3...P0				已保留				Slave 22B: P3...P0			

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
28	已保留				Slave 25B: P3...P0				已保留				Slave 24B: P3...P0			
29	已保留				Slave 27B: P3...P0				已保留				Slave 26B: P3...P0			
30	已保留				Slave 29B: P3...P0				已保留				Slave 28B: P3...P0			
31	已保留				Slave 31B: P3...P0				已保留				Slave 30B: P3...P0			

DS14 – Image of the output parameters of the slaves

8783

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	已保留				Slave 1(A): P3...P0				已保留				已保留			
1	已保留				Slave 3(A): P3...P0				已保留				Slave 2(A): P3...P0			
2	已保留				Slave 5(A): P3...P0				已保留				Slave 4(A): P3...P0			
3	已保留				Slave 7(A): P3...P0				已保留				Slave 6(A): P3...P0			
4	已保留				Slave 9(A): P3...P0				已保留				Slave 8(A): P3...P0			
5	已保留				Slave 11(A): P3...P0				已保留				Slave 10(A): P3...P0			
6	已保留				Slave 13(A): P3...P0				已保留				Slave 12(A): P3...P0			
7	已保留				Slave 15(A): P3...P0				已保留				Slave 14(A): P3...P0			
8	已保留				Slave 17(A): P3...P0				已保留				Slave 16(A): P3...P0			
9	已保留				Slave 19(A): P3...P0				已保留				Slave 18(A): P3...P0			
10	已保留				Slave 21(A): P3...P0				已保留				Slave 20(A): P3...P0			
11	已保留				Slave 23(A): P3...P0				已保留				Slave 22(A): P3...P0			
12	已保留				Slave 25(A): P3...P0				已保留				Slave 24(A): P3...P0			
13	已保留				Slave 27(A): P3...P0				已保留				Slave 26(A): P3...P0			
14	已保留				Slave 29(A): P3...P0				已保留				Slave 28(A): P3...P0			
15	已保留				Slave 31(A): P3...P0				已保留				Slave 30(A): P3...P0			
16	已保留				Slave 1B: P3...P0				已保留				已保留			
17	已保留				Slave 3B: P3...P0				已保留				Slave 2B: P3...P0			
18	已保留				Slave 5B: P3...P0				已保留				Slave 4B: P3...P0			
19	已保留				Slave 7B: P3...P0				已保留				Slave 6B: P3...P0			
20	已保留				Slave 9B: P3...P0				已保留				Slave 8B: P3...P0			
21	已保留				Slave 11B: P3...P0				已保留				Slave 10B: P3...P0			
22	已保留				Slave 13B: P3...P0				已保留				Slave 12B: P3...P0			
23	已保留				Slave 15B: P3...P0				已保留				Slave 14B: P3...P0			
24	已保留				Slave 17B: P3...P0				已保留				Slave 16B: P3...P0			
25	已保留				Slave 19B: P3...P0				已保留				Slave 18B: P3...P0			
26	已保留				Slave 21B: P3...P0				已保留				Slave 20B: P3...P0			
27	已保留				Slave 23B: P3...P0				已保留				Slave 22B: P3...P0			

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
28	已保留				Slave 25B: P3...P0				已保留				Slave 24B: P3...P0			
29	已保留				Slave 27B: P3...P0				已保留				Slave 26B: P3...P0			
30	已保留				Slave 29B: P3...P0				已保留				Slave 28B: P3...P0			
31	已保留				Slave 31B: P3...P0				已保留				Slave 30B: P3...P0			

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	已保留															
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) **Bit 1:** Configuration error type 2 (too many slaves) **Bit 2:** Configuration error type 3 (slave with wrong profile) **Bit 3:** Peripheral fault **Bit 4:** Double address **Bit 8:** internal AS-i master error **Bit 9:** Projection mode **Bit 10:** Slave address 0 detected **Bit 11:** Earth fault **Bit 12:** Voltage drop below 22.5 V **Bit 13:** Voltage drop below 19.0 V **Bit 14:** 已保留 **Bit 15:** 已保留
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 **Bit15:** bit with sign

DS17 – 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

DS18 – Fieldbus information

10711

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 0x01 = Profinet 0x02 = Profibus 0x03 = EtherNet/IP 0x04 = EtherCAT
Fieldbus status	Status of the fieldbus connection	1 byte	0x00 = initialisation 0x01 = waiting for connection 0x02 = connection is being established 0x03 = configuration of the connection in progress 0x04 = parameter setting in progress 0x05 = waiting for module configuration 0x06 = cyclic data exchange with the fieldbus controller/host 0x07 = connection release
Profibus slave address	Profibus address of the device	1 byte	0x00 = no Profibus 0x03 = address 3 ... 0x7B = address 123

Ethernet connection status	Status and Ethernet connections on ports X6 and X7	1 byte	0x00 = no connection or Profibus 0x01 = connection on port X7 established, no connection on port X6 0x02 = connection on port X6 established, no connection on port X7 0x03 = connection on ports X6 and X7 established
Profinet/ EtherNet/IP IP address / EtherCAT-Adresse	address of the device	4 bytes	▪ for Profinet/EtherNet/IP: IP address One address segment per byte. e.g. `192.168.0.102` Byte 1: 192 = 0xC0 Byte 2: 168 = 0xA8 Byte 3: 0 = 0x00 Byte 4: 102 = 0x66 ▪ for EtherCAT: EtherCAT address (Configured Station Alias or Second Station Address) e.g. 3577 = 0xDF9 Byte 1: 0x0D Byte 2: 0xF9 Byte 3: 0x00 Byte 4 0x00
Profinet/ EtherNet/IP-Subnet mask	Subnet mask of the Ethernet network	4 bytes	One address segment per byte (structre: → Profinet/EtherNet/IP IP address)
Profinet/ EtherNet/IP gateway address	IP address of the EtherNet gateway	4 bytes	One address segment per byte (structre: → Profinet/EtherNet/IP IP address)
MAC0	MAC0-ID of the device	6 bytes	One MAC segment per byte: e.g. `00:02:01:01:98:D2` Byte 1: 0xD2 ... Byte 6: 0x00 ▪ Profinet: MAC0 = MAC of the fieldbus interface ▪ 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) ▪ Profinet: MAC1 = MAC of the Ethernet port X6 ▪ EtherNet/IP: MAC1 = MAC2 = MAC of the EtherNet/IP interface ▪ Profibus/EtherCAT: MAC1 = 00:00:00:00:00:00
MAC2	MAC2-ID of the device	6 bytes	One MAC segment per byte (structure: → MAC0) ▪ Profinet: MAC2 = MAC of the Ethernet port X7 ▪ EtherNet/IP: MAC2 = MAC1 = MAC of the fieldbus interface ▪ 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 (structure. → Profinet/EtherNet/IP IP address) ▪ Profinet: IP address of the Profinet host ▪ Profibus/EtherNet/IP/EtherCAT: Byte 1: 0x00 Byte 2: 0x00 Byte 3: 0x00 Byte 4: 0x00

DS20 – Error distribution frame errors

16189

The data set contains the added frame errors (burst errors) for each slave. Consecutive errors (1-fold to 6-fold burst errors) are counted seperatly.

n	Word (n+2)	Word (n+1)	Word (n)
0	3-fold errors slave 1(A)	2-fold errors slave 1(A)	1-fold errors slave 1(A)
3	6-fold errors slave 1(A)	5-fold errors Slave 1(A)	4-fold errors slave 1(A)
6	3-fold errors slave 2(A)	2-fold errors slave 2(A)	1-fold errors slave 2(A)
9	6-fold errors slave 2(A)	5-fold errors slave 2(A)	4-fold errors slave 2(A)
...	...	...	...
180	6-fold errors slave 31(A	5-fold errors slave 31(A)	4-fold errors slave 31(A)
183	3-fold errors slave 31(A)	2-fold errors slave 31(A)	1-fold errors slave 31(A)
186	6-fold errors slave 1B	5-fold errors slave 1B	4-fold errors slave 1B
189	3-fold errors slave 1B	2-fold errors slave 1B	1-fold errors slave 1B
...	...	...	...
366	3-fold errors slave 31B	2-fold errors slave 31B	1-fold errors slave 31B
369	6-fold errors slave 31B	5-fold errors slave 31B	4-fold errors slave 31B

DS21 – Data from AC140n PLC to fieldbus PLC

1815

Offset Word no.	bit															
	15	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
0	已保留								Number of used PLC data bytes							
1	PLC data byte 1								PLC data byte 0							
2	PLC data byte 3								PLC data byte 2							
...	...								...							
119	PLC data byte 237								PLC data byte 236							
120	PLC data byte 239								PLC data byte 238							

All 120 words are available for the transfer of PLC data. The number set in word 0 only indicates, how many bytes actually are used for data transfer.

DS22 – Data from fieldbus PLC to AC140n PLC

309

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	已保留								Number of used PLC data bytes							
1	PLC data byte 1								PLC data byte 0							
2	PLC data byte 3								PLC data byte 2							
...	...								...							
119	PLC data byte 237								PLC data byte 236							
120	PLC data byte 239								PLC data byte 238							

All 120 words are available for the transfer of PLC data. The number set in word 0 only indicates, how many bytes actually are used for data transfer.

Command channels

内容

16573

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	已保留								Command status (→ 页 222)							
4	command error code															
5...120	reply data to the command Unused bytes receive invalid values from old command replies. DO NOT evaluate!															

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.

System commands

内容

11077

Overview: System commands

11078

Comm. no. [hex]	Comm. no. [dec]	Description
0101	257	Quick setup AS-i master 1 (and AS-i master 2, if available)
0103	259	Change the user language
0104	260	Change the display settings
0105	261	Configure the output access
0106	262	Set the PLC operating mode
0109	265	Set the date / time
010A	266	Set the NTP server parameters
010B	267	Read date / time / NTP settings
010C	268	Reboot the system
010D	269	Read fieldbus information (can only be executed in CODESYS!)
010F	271	Read message text of an OSC entry
0110	272	Display target visualization

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	已保留								已保留						M2	M1
4 ...120	The area is completely ignored. 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 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 1 = "Quick set-up" command is executed on the master
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								**Command status** (→ 页 222)							
4	command error code AS-i master 2 **Possible command error codes** (→ 页 225)								command error code AS-i master 1 **Possible command error codes** (→ 页 225)							

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: - 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.

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. 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 0x4445 = DE, German 0x454E = EN, English (default) 0x4652 = FR, French 0x4954 = IT, Italian 0x4553 = ES, Spanish 0x5054 = PT, Portuguese
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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)

10746

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	已保留								Command status (→ 页 222)							
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.

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	已保留								已保留						RS	DS
4 ... 120	The area is completely ignored. 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 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 1 = when the time has elapsed, devices changes to the splash screen
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								**Command status** (→ 页 222)							
4	command error code															

Possible command error codes

11101

There are no error messages for this command.

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	已保留								OC							
4 ... 120	The area is completely ignored. 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 0x02 = MAN, manual 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	已保留								**Command status** (→ 页 222)							
4	command error code															

Possible command error codes

16687

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

Error code only appears if command status = FAILED.

Command 0x0106 – Set PLC operating mode

10763

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

Command request channel (fieldbus master >>> device)

10764

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	已保留								已保留							PLC
4 ... 120	The area is completely ignored. 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 0x01 = switch on PLC and start PLC application (boot application)

Command response channel (device >>> fieldbus master)

10766

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	已保留								Command status (→ 页 222)							
4	command error code															

Possible command error codes

10767

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

Error code only appears if command status = FAILED.

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	已保留								seconds							
7 ... 120	The area is completely ignored. It does not matter whether the data area exists or what data is contained.															

Legend:

day	day	1 byte	0x01 = 1 0x02 = 2 ... 0x1F = 31
month	month	1 byte	0x01 = January 0x02 = February ... 0x0C = December
Year	Year	1 word	Possible values: 1971 ... 2037 0x07B3 = 1971 0x07B4 = 1972 ... 0x07F5 = 2037 Example: 2014 = 0x07DE year (MSB) = 0x07, year (LSB) = 0xDE
hours	hours	1 byte	0x00 = 0 0x01 = 1 ... 0x17 = 23
minutes	minutes	1 byte	0x00 = 0 0x01 = 1 ... 0x3B = 59
seconds	seconds	1 byte	0x00 = 0 0x01 = 1 ... 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	已保留								Command status (→ 页 222)							
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. Deactivate NTP to be able to set the time.

Error code appears if command status = FAILED

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								已保留							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. 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 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 0x01 = UTC -12:00 0x02 = UTC -11:00 0x03 = UTC -10:00 0x04 = UTC -09:00 0x05 = UTC -08:00 0x06 = UTC -07:00 0x07 = UTC -06:00 0x08 = UTC -05:00 0x09 = UTC -04:00 0x0A = UTC -03:30 0x0B = UTC -03:00 0x0C = UTC -02:00 0x0D = UTC -01:00 0x0E = UTC +00:00 0x0F = UTC +01:00 0x10 = UTC +02:00 0x11 = UTC +03:00 0x12 = UTC +03:30 0x13 = UTC +04:00 0x14 = UTC +04:30 0x15 = UTC +05:00 0x16 = UTC +05:30 0x17 = UTC +05:45 0x18 = UTC +06:00 0x19 = UTC +06:30 0x1A = UTC +07:00 0x1B = UTC +08:00 0x1C = UTC +09:00 0x1D = UTC +09:30 0x1E = UTC +10:00 0x1F = UTC +11:00 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 0x00 = 000 0x01 = 001 ... 0x0FF = 255 Example: IP address: 192.168.150.5 192 = 0xC0 (high byte) 168 = 0xA8 150 = 0x96 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	已保留								Command status (→ 页 222)							
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

Command 0x010B – Read date / time / NTP settings

10792

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

Command request channel (fieldbus master >>> device)

10793

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. It does not matter whether the data area exists or what data is contained.															

Command response channel (device >>> fieldbus master)

10794

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	已保留								**Command status** (→ 页 222)							
4	command error code															
5	month								day							
6	year (byte 2, MSB)								year (byte 1, LSB)							
7	minutes								hours							
8	已保留								seconds							
9	NTP Offset								已保留							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 - month - year - hours - minutes - seconds	→ **Command 0x010A – Set parameters of the NTP server** (→ 页 231)
- NTP - NTP Offset - NTP server IP address	→ **Command 0x010A – Set parameters of the NTP server** (→ 页 231)

Possible command error codes

10796

Error Code	Error	Description
0x00		no error

Command 0x010C – Reboot system

10798

Using the command, the device can be restarted.

Command request channel (fieldbus master >>> device)

10799

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. It does not matter whether the data area exists or what data is contained.															

Legend:

UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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)

10800

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	已保留								**Command status** (→ 页 222)							
4	command error code															

Possible command error codes

10801

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

Error code only appears if command status = FAILED.

Command 0x010D – Read fieldbus info

10804

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)

10805

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. It does not matter whether the data area exists or what data is contained.															

Command response channel (device >>> fieldbus master)

10806

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	已保留								**Command status** (→ 页 222)							
4	command error code															
5 ... 23	→ **DS18 – Fieldbus information** (→ 页 218)															
24 ... 120	The area is completely ignored. It does not matter whether the data area exists or what data is contained.															

Possible command error codes

10808

Error Code	Error	Description
0x00		no error

Command 0x010F – Read message text of an OSC entry

8653

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)

10810

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. It does not matter whether the data area exists or what data is contained.															

Record Handle	Address of the OSC entry	2 words	▪ Low Word: 0x000 = current OSC entry ▪ High Word: 0x0000 = current OSC entry

Command response channel (device >>> fieldbus master)

1817

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	已保留								**Command status** (→ 页 222)							
4	command error code															
5 ... n	Record Message Text (UTF8, zero terminated)															
(n+1) ... 120	The area is completely ignored. It does not matter whether the data area exists or what data is contained.															

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

Possible command error codes

10811

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.

Command 0x0110 – Display target visualisation

7910

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)

10815

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. 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 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 0x0001 = key combination disabled

Command reply channel (device >>> fieldbus master)

10816

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	已保留								Command status (→ 页 222)							
4	command error code															

Possible command error codes

10817

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

AS-i master commands

内容

8797

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 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: Acyclic standard read call of an AS-i slave with CTT2 profile	CTT2 slave profile *)
0025	37	CTT2 standard write: Acyclic standard write call of an AS-i slave with CTT2 profile	CTT2 slave profile *)
0026	38	CTT2 vendor specific read: acyclic manufacturer-specific read call of an AS-i slave with CTT2 profile	CTT2 slave profile *)
0027	39	CTT2 vendor specific write: acyclic manufacturer-specific write call of an AS-i slave with CTT2 profile	CTT2 slave profile *)
0040	64	CTT2 device group read: Acyclic devicegroup read call of an AS-i slave with CTT2 profile	CTT2 slave profile *)
0041	65	CTT2 device group write: Acyclic devicegroup write call of an AS-i slave with CTT2 profile	CTT2 slave profile *)
0042	66	CTT2 vendor specific selective read from buffer: Selective standard read call of an AS-i slave with CTT2 profile	CTT2 slave profile *)
0043	67	CTT2 vendor specific selective write from buffer: Selective standard write call of an AS-i slave with CTT2 profile	CTT2 slave profile *)
0044	68	CTT2 vendor specific selective read: Selective manufacturer-specific read call of an AS-i slave with CTT2 profile	CTT2 slave profile *)
0045	69	CTT2 vendor specific selective write: 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: Selective devicegroup read call of an AS-i slave with CTT2 profile	CTT2 slave profile *)
0047	71	CTT2 device group selective write: Selective devicegroup write call of an AS-i slave with CTT2 profile	CTT2 slave profile *)
0049	73	CTT2 vendor specific exchange: Manufacturer-specific data exchange with an AS-i slave with CTTS profile	CTT2 slave profile *)
004A	74	CTT2 device group exchange: Devicegroup data exchange with an AS-i slave with CTTS profile	CTT2 slave profile *)
004B	75	CTT2 device group selective read from buffer: 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: 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** (→ 页 171)

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

Error codes of the AS-i master commands

内容

8836

General error codes

5682

Revision: 2014-03-05

Error Code	Error	Description
0x01	NOK	no slave response OR: 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: - wrong slave profile (is not S-7.4) or: - slave is not in LAS or: - 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; → **CTT2 error codes** (→ 页 246)
	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 (→ **standard CTT2 error codes** (→ 页 246))
1...4	manufacturer-specific error information (→ data sheet of the AS-i slave)

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** (→ 页 250)

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	已保留								已保留		ST	SLA				
4	已保留								已保留				New output parameter			
5...120	The area is completely ignored. 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								**Command status** (→ 页 222)							
4	command error code															
5	已保留								已保留				Input parameters			
6 ... 120	The area is completely ignored. 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: 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

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** (→ 页 250)

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. It does not matter whether the data area exists or what data is contained.															

Legende:

UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
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

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** (→ 页 250)

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. It does not matter whether the data area exists or what data is contained.															

Legend:

UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															

Possible command error codes

11112

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

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	已保留								MOD							
4 ... 120	The area is completely ignored. 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) 0x01 = set master to the projection mode
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															

Possible command error codes

11115

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

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** (→ 页 250)

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	已保留								已保留		ST	old SLA				
4	已保留								已保留		ST	new SLA				
5...120	The area is completely ignored. 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															

Possible command error codes

11118

Error Code	Error	Description
0x00		no error
0x01	NOK	no slave response OR: 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

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	已保留								AutoAd							
4 ... 120	The area is completely ignored. It does not matter whether the data area exists or what data is contained.															

Legend:

AutoAd	automatic addressing	1 byte	00 = deactivate automatic addressing 01 = activate automatic addressing
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								**Command status** (→ 页 222)							
4	command error code															

Possible command error codes

11101

There are no error messages for this command.

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	已保留								已保留		ST	SLA				
4	已保留								new Extended ID-Code 1							
5 ... 120	The area is completely ignored. 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								**Command status** (→ 页 222)							
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)

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	已保留															
4	Slave 1(A)															
5	Slave 2(A)															
6	Slave 3(A)															
7	Slave 4(A)															
8	Slave 5(A)															
9	Slave 6(A)															
10	Slave 7(A)															
11	Slave 8(A)															
12	Slave 9(A)															
13	Slave 10(A)															
14	Slave 11(A)															
15	Slave 12(A)															
16	Slave 13(A)															
17	Slave 14(A)															
18	Slave 15(A)															

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			
19	Slave 16(A)															
20	Slave 17(A)															
21	Slave 18(A)															
22	Slave 19(A)															
23	Slave 20(A)															
24	Slave 21(A)															
25	Slave 22(A)															
26	Slave 23(A)															
27	Slave 24(A)															
28	Slave 25(A)															
29	Slave 26(A)															
30	Slave 27(A)															
31	Slave 28(A)															
32	Slave 29(A)															
33	Slave 30(A)															
34	Slave 31(A)															
35	已保留															
36	Slave 1B															
37	Slave 2B															
38	Slave 3B															
39	Slave 4B															
40	Slave 5B															
41	Slave 6B															
42	Slave 7B															
43	Slave 8B															
44	Slave 9B															
45	Slave 10B															
46	Slave 11B															
47	Slave 12B															
48	Slave 13B															
49	Slave 14B															
50	Slave 15B															
51	Slave 16B															
52	Slave 17B															
53	Slave 18B															
54	Slave 19B															
55	Slave 20B															

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			
56	Slave 21B															
57	Slave 22B															
58	Slave 23B															
59	Slave 24B															
60	Slave 25B															
61	Slave 26B															
62	Slave 27B															
63	Slave 28B															
64	Slave 29B															
65	Slave 30B															
66	Slave 31B															
67...120	The area is completely ignored. It does not matter whether the data area exists or what data is contained.															

Legend:

UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															

Possible command error codes

11112

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

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. It does not matter whether the data area exists or what data is contained.															

Legende:

UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	已保留								已保留		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. 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 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) 1 = AS-i voltage < 22.5 V 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) 1 = AS-i voltage < 19 V There is an AS-i power fail (24V APF)
PM	**p**ower**m**odule	1 bit	0 = no data decoupling module is connected 1 = a data decoupling module is connected
PS	**p**ower**s**ource	1 bit	0 = the device is supplied from AUX 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) 1 = earth fault detection provides valid data

Possible command error codes

11101

There are no error messages for this command.

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	已保留								已保留		ST	SLA				
4 ... 120	The area is completely ignored. 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	Number of bytes received as from word no. 4								已保留		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			已保留		Diag	已保留	
8	EDT Write			已保留					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. 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 0 = simple data transfer 1 = double data transfer
	number of parameter bytes to be read	1 byte	number of bytes which can be read as parameter string 00 = no parameter string readable 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 00 = no parameter string readable 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 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 00 = reserved 01 = transmitted values are measured values 02 = transmitted values are 16 digital bit values 03 = normal operation in 4-bit mode (4I/4O) 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 0 = input 1 = output
Mux field	number of multiplexed data words	3 bits	0…3 number = value in "Mux field" +1
ST	slave type	1 bit	0 = single slave or A slave 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: 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: - wrong slave profile (is not S-7.4) or: - slave is not in LAS or: - master is not in the Protected mode

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. It does not matter whether the data area exists or what data is contained.															

Legende:

UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
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. 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 0x01 = device has 2 AS-i masters

Possible command error codes

11101

There are no error messages for this command.

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	已保留								OLP							
4 ... 120	The area is completely ignored. It does not matter whether the data area exists or what data is contained.															

Legend:

OLP	offline phase = slave reset	1 byte	0x00 = offline phase when changing over to the protected mode 0x01 = no offline phase when changing over to the protected mode
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								**Command status** (→ 页 222)							
4	command error code															

Possible command error codes

11101

There are no error messages for this command.

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	已保留								已保留		ST	SLA				
4 ... 120	The area is completely ignored. 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	Number of bytes received								已保留		ST	reflected slave address				
6...m	Diagnosis byte n+1								Diagnosis byte n							
(m+1)...120	The area is completely ignored. 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 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: 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: - wrong slave profile (is not S-7.4) or: - slave is not in LAS or: - master is not in the Protected mode

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	已保留								已保留		ST	SLA				
4 ... 120	The area is completely ignored. 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	Number of bytes received								已保留		ST	reflected slave address				
6 ... m	Parameter byte n+1								Parameter byte n							
(m+1) ... 120	The area is completely ignored. 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 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: 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: - wrong slave profile (is not S-7.4) or: - slave is not in LAS or: - master is not in the Protected mode

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								已保留		ST	SLA				
4...m	parameter byte n+1								parameter byte n							
(m+1)...120	The area is completely ignored. 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	Number of bytes received								已保留		ST	reflected slave address				
6 ... m	Parameter byte n+1								Parameter byte n							
(m+1) ... 120	The area is completely ignored. 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 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 OR: 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: - wrong slave profile (is not S-7.4) or: - slave is not in LAS or: - master is not in the Protected mode

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	已保留								已保留		ST	SLA				
4	DL								IX							
5 ... 120	The area is completely ignored. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
IX	index	1 byte	pointer to the page to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	number of bytes received								已保留		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 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x50 = No CTT2 error on command execution : The following data bytes contain the requested data. 0x90 = CTT2 error on command execution: - Data byte 0 contains → Standard CTT2 error codes (→ 页 246). - 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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

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	已保留								已保留		ST	SLA				
4	DL								IX							
5 ... m	Data byte (n+1)								Data byte n							
(m+1) ... 120	The area is completely ignored. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
IX	index	1 byte	pointer to the page to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	Command error code															
5	已保留								已保留		ST	Reflected slave address				
6	data byte 0								RC							

Legend:

ST	slave type	1 bit	0 = single slave or A slave 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x51 = No CTT2 error on command execution : The data in the following data bytes is irrelevant. 0x91 = CTT2 error on command execution: Data byte 0 contains → Standard CTT2 error codes (→ 页 246).

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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

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	已保留								已保留		ST	SLA				
4	DL								IX							
5 ... 120	The area is completely ignored. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
IX	index	1 byte	pointer to the page to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	number of bytes received								已保留		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 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x52 = No CTT2 error on command execution : The following data bytes contain the requested data. 0x92 = CTT2 error on command execution: The following data bytes 0...5 contain → CTT2 error object (→ 页 246).

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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

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	已保留								已保留		ST	SLA				
4	DL								IX							
5 ... m	Data byte (n+1)								Data byte n							
(m+1) ... 120	The area is completely ignored. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
IX	index	1 byte	pointer to the page to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	已保留								已保留		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 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x53 = No CTT2 error on command execution : The data in the following data bytes is irrelevant. 0x93 = CTT2 error on command execution: The following data bytes 0...5 contain → CTT2 error object (→ 页 246).

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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

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	已保留								已保留		ST	SLA				
4	DL								IX							
5 ... 120	The area is completely ignored. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
IX	index	1 byte	pointer to the page to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	number of bytes received								已保留		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 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x54 = No CTT2 error on command execution : The following data bytes contain the requested data. 0x94 = CTT2 error on command execution: The following data bytes 0...5 contain → CTT2 error object (→ 页 246).

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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

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	已保留								已保留		ST	SLA				
4	DL								IX							
5 ... m	Data byte (n+1)								Data byte n							
(m+1) ... 120	The area is completely ignored. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
IX	index	1 byte	pointer to the page to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	已保留								已保留		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 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x55 = No CTT2 error on command execution : The data in the following data bytes is irrelevant. 0x95 = CTT2 error on command execution: The following data bytes 0...5 contain → CTT2 error object (→ 页 246).

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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

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	已保留								已保留		ST	SLA				
4	SIX								IX							
5 ... m	已保留								DL							
(m+1) ... 120	The area is completely ignored. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
IX	index	1 byte	pointer to the page to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	number of bytes received								已保留		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 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x58 = No CTT2 error on command execution : The following data bytes contain the requested data. 0x98 = CTT2 error on command execution: The following data bytes 0...5 contain → CTT2 error object (→ 页 246).

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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

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	已保留								已保留		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. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
IX	index	1 byte	pointer to the page to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	number of bytes received								已保留		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 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x59 = No CTT2 error on command execution : Data byte 0 contains the number of bytes to be read (block length); Valid values: 0x00 ... 0xFF (→ data sheet of the AS-i slave) 0x99 = CTT2 error on command execution: The following data bytes 0...5 contain → CTT2 error object (→ 页 246).

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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

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	已保留								已保留		ST	SLA				
4	SIX								IX							
5 ... m	已保留								DL							
(m+1) ... 120	The area is completely ignored. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
IX	index	1 byte	pointer to the page to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	number of bytes received								已保留		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 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x58 = No CTT2 error on command execution : The following data bytes contain the requested data. 0x98 = CTT2 error on command execution: The following data bytes 0...5 contain → CTT2 error object (→ 页 246).

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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

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	已保留								已保留		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. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
IX	index	1 byte	pointer to the page to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	number of bytes received								已保留		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 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x59 = No CTT2 error on command execution : Data byte 0 contains the number of bytes to be read (block length); Valid values: 0x00 ... 0xFF (→ data sheet of the AS-i slave) 0x99 = CTT2 error on command execution: The following data bytes 0...5 contain → CTT2 error object (→ 页 246).

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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

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	已保留								已保留		ST	SLA				
4	SIX								IX							
5 ... m	已保留								DL							
(m+1) ... 120	The area is completely ignored. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
IX	index	1 byte	pointer to the page to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	number of bytes received								已保留		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 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x5A = No CTT2 error on command execution : The following data bytes contain the requested data. 0x9A = CTT2 error on command execution: The following data bytes 0...5 contain → CTT2 error object (→ 页 246).

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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

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	已保留								已保留		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. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
IX	index	1 byte	pointer to the page to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	number of bytes received								已保留		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 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x5B = No CTT2 error on command execution : Data byte 0 contains the block length (= number of bytes to be read); Valid values: 0x00 ... 0xFF (→ data sheet of the AS-i slave) 0x9B = CTT2 error on command execution: The following data bytes 0...5 contain → **CTT2 error object** (→ 页 246).

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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

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	已保留								已保留		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. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
RL	read length	1 byte	number of bytes to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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 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	已保留								Command status (→ 页 222)							
4	command error code															
5	number of bytes received								已保留		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 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x5D = No CTT2 error on command execution The following data bytes contain the requested data. 0x9D = CTT2 error on command execution The following data bytes 0...5 contain → CTT2 error object (→ 页 246).

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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

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	已保留								已保留		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. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
RL	read length	1 byte	number of bytes to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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 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	已保留								Command status (→ 页 222)							
4	command error code															
5	number of bytes received								已保留		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 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x5E = No CTT2 error on command execution : The following data bytes contain the requested data. 0x9E = CTT2 error on command execution: The following data bytes 0...5 contain → CTT2 error object (→ 页 246).

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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

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	已保留								已保留		ST	SLA				
4	SIX								IX							
5 ... m	已保留								DL							
(m+1) ... 120	The area is completely ignored. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
IX	index	1 byte	pointer to the page to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	number of bytes received								已保留		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 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x5A = No CTT2 error on command execution : The following data bytes contain the requested data. 0x9A = CTT2 error on command execution: The following data bytes 0...5 contain → CTT2 error object (→ 页 246).

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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

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	已保留								已保留		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. 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 permitted values: 0x00…0xFF = 0…255 (→ data sheet of the slave)
IX	index	1 byte	pointer to the page to be read 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 1 = B slave (= addition of 0x1F to the slave address)
UID	user ID	1 word	0x0000…0xFFFF = 0…65535 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	已保留								Command status (→ 页 222)							
4	command error code															
5	number of bytes received								已保留		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 1 = B slave (= addition of 0x1F to the slave address)
RC	CTT2 Response Code	1 byte	0x5B = No CTT2 error on command execution : Data byte 0 contains the block length (= number of bytes to be read); Valid values: 0x00 ... 0xFF (→ data sheet of the AS-i slave) 0x9B = CTT2 error on command execution: The following data bytes 0...5 contain → **CTT2 error object** (→ 页 246).

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: - Wrong slave profile (is not S-7.4) or: - Slave is not in LAS or: - 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

Command 0x0050 – Adjust AS-i master settings

10950

Command request channel (fieldbus master >>> device)

10951

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. 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) 0x02 = double address recognition (DAE)
MOD	Activate/deactivate the selected diagnostic function in the settings	0 = deactivate function 1 = activate function

Command response channel (device >>> fieldbus master)

10952

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	已保留								**Command status** (→ 页 222)							
4	command error code															

Possible command error codes

10953

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

Command 0x0051 – Reset error counter

10956

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)

10957

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. It does not matter whether the data area exists or what data is contained.															

Command response channel (device >>> fieldbus master)

10958

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	已保留								**Command status** (→ 页 222)							
4	command error code															

Possible command error codes

11101

There are no error messages for this command.

Step7 programmer's notes: call acyclic services

9215

In the projection software, standard function blocks are used for the acyclic data exchange between a Profinet IO controller and the AC140n.

Siemens S7 controllers provide two standard function blocks:

- SFB52 RDREC for reading acyclic data
- SFB53 WRREC for writing acyclic data

For detailed information regarding SFB52 and SFB53: → operating instructions of the Siemens S7 controller!

Error codes of the acyclic services

16656

SFB52 and SFB53 provide a 32-bit value at their "Status" output which informs about any problems during processing. The error message is structured as follows:

Bits 31...24	Bits 23...16	Bits 15...8	Bits 7...0
Error code	Error decode	Error code 1	Error code 2

The following error messages for acyclic services have been implemented in the ifm device:

Error number [hex]	Error name	Description
8180 A200	PNIO_RW_APP_MODUL_FAILURE	Error when executing the command
8180 B100	PNIO_RW_WRITE_LENGTH_ERROR	Too many bytes to be written to the resource
8180 B600	PNIO_RW_ACCESS_DENIED	The access to a resource was blocked (e.g. outputs if not in the gateway mode)
8180 B700	PNIO_RW_ACCESS_INVALID_LENGTH	More bytes are to be read than are provided by the resource
8180 C300	PNIO_RW_RESOURCE_UNAVAILABLE	The resource does not provide any data
DE80 A900	IORDRES_RW_APP_FEATURE_UNSUPPORTED	The selected resource is not supported
DF80 B100	IOWRRES_RW_WRITE_LENGTH_ERROR	The number of bytes to be written is too high
DF80 B200	IOWRRES_RW_ACCESS_INVALID_SLOT	The selected slot is invalid

8.7.5 I&M data

内容

14840

Data structures (= data records) have been defined for identification and maintenance (I&M) in this fieldbus. I&M0 is absolutely necessary for the certification.

I&M data addressing

8869

Revision: 2011-11-16

The I&M data can be read from the device or write to the device with the following addressing (not I&M0!):

I&M	Slot / module	Sub-slot	Index *) [hex]	Length [bytes]	Read	Write	Absolutely necessary
I&M 0	0	1	AFF0	54	X	--	X
I&M 1	0	1	AFF1	54	X	X	--
I&M 2	0	1	AFF2	54	X	X	--
I&M 3	0	1	AFF3	54	X	X	--
I&M 4	0	1	AFF4	54	X	X	--

I&M0 data

8870

I&M0 provide the user with device-specific basic information. This permits a clear identification of the device with its hardware and software components as well as the manufacturer.

Date	Bytes	Content	Description
Profinet Block Header	6		Manufacturer specific
MANUFACTURER_ID	2	310	Manufacturer ID of ifm
ORDER_ID	20	e.g. AC14xx	Device order number (ASCII characters) Unneeded characters are filled with 0x20 (blank)
SERIAL_NUMBER	16		12-digit serial number of the device (ASCII) Unneeded characters are filled with 0x20 (blank)
HARDWARE_REVISION	2	e.g. AA	Device version (2 ASCII characters)
SOFTWARE_REVISION	4	e.g. V3.0.8	e.g. V3.0.8 Byte 0 = software type (char): V (= official release) Byte 1 = major version (uint8): 3 Byte 2 = minor version (uint8): 0 Byte 3 = build version (uint8): 8
REVISION_COUNTER	2	0x0001...0xFFFF	Revision counter of the device. If changes are made to the device data, the revision counter is incremented. Changes to the device data are for example the installation of a new firmware or changed device parameters.
PROFILE_ID	2	0xF600	ID for generic device
PROFILE_SPECIFIC_TYPE	2	0x0000	No profiles are supported
IM_VERSION	2	e.g. 1.1	The currently up-to-date version of the I&M data Byte 0 = major version (uint8): 1 Byte 1 = minor version (uint8): 1
IM_SUPPORTED	2	0x001E	Supported I&M data: I&M1...I&M4

8.7.6 Fieldbus alarms

内容

8871

Depending on the compatibility mode currently active the AC140n supports the following diagnosis / alarm options.

Process alarms

8872

Process alarms are used when a critical value or status occurs during the process in the plant. This can be the case e.g. when the temperature of a tank is too low or too high.

The process alarms are application-specific. For this reason, the manufacturer does not implement process alarms in this device.

Diagnosis alarms

9144

Diagnosis alarms are used where an error or event occurs in the device.

Examples:

- AS-i configuration error
- Peripheral fault on an AS-i slave

- **Slot:** 0 (corresponds to the host; in the ifm classic mapping model, this is the AC140n)
- **sub-slot:** 1 (others are not supported from some Profinet-controllers.
- **Channel**: 0x08000 (fixed, others are not supported)
- **Channel property:** is always "diagnosis"
- **Alarm numbers:** are in the "Manufacturer Specific" area (0x0100 and 0x7FFF)
- All used alarms are "standard alarms" and use the "Add Channel Diagnosis Request" function on the Hilscher Alarm API.

Device diagnosis alarms

8874

Alarm type ID	Description	Slot / sub-slot / channel	Alarm parameter
0x0100	internal device system error cause of error → alarm parameter	0 / 1 / 0x8000	cause of error
0x0101	excess temperature: temperature inside the device has exceeded the permitted max. value of 80 ° celsius.	0 / 1 / 0x8000	device temperature
0x0104	the gateway mode is deactivated	0 / 1 / 0x8000	--

AS-i diagnosis alarms

8875

Alarm type ID	Description	Slot / sub-slot / channel	Alarm parameters
0x0200	internal system error of an AS-i master	M / 1 / 0x8000	master number, cause of error
0x0202	AS-i master was set to the projection mode	M / 1 / 0x8000	master number
0x0203	new slave 0 was detected	M / 1 / 0x8000	master number
0x0204	earth fault was detected	M / 1 / 0x8000	master number, symmetry
0x0207	22.5 V AS-i power failure was detected (classic ASi power)	M / 1 / 0x8000	master number
0x0208	19 V AS-i power failure was detected (Power24)	M / 1 / 0x8000	master number
0x03(SLA)	configuration error, too many slaves	M / 1 / 0x8000	master number, slave address
0x04(SLA)	configuration error, slave missing	M / 1 / 0x8000	master number, slave address
0x05(SLA)	configuration error, slave has wrong profile	M / 1 / 0x8000	master number, slave address
0x06(SLA)	periphery fault	M / 1 / 0x8000	master number, slave address
0x0701...0x071F	double addressing fault	M / 1 / 0x8000	master number, slave address

Legend:

M	master no.	1 bit	0 = AS-i master 1 1 = AS-i master 2
SLA	slave address	1 byte	slaves 1(A)...31(A): 0x01…0x1F = 1…31 slaves 1B...31B: 0x21…0x3F = 33…63

Configuration and periphery faults are signalled in slot 1 for AS-i master 1 and in slot 2 for AS-i master 2. The subslot is always 1, the channel always 0x8000.

The alarm type ID indicates ...
- the type of error occurred (with the high byte of the alarm type ID)
- the slave address causing the error (with the low byte of the alarm type ID).

If there is more than one slave address causing an error, several alarms are sent. The alarms are independent of each other and remain set as long as the reason for the alarm exists.

The following tables list the complete assignment of alarm type ID by error type and slave address.

Diagnosis data of the alarms

内容

8876

After an incoming alarm the data for the diagnosis is only available in the Profinet device until the outgoing alarm is received.

Below you will find a description of which diagnosis data is available in the event of an alarm.

Alarm 0x0100 – internal device system error

8877

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	cause of error															

Please ask your AS-i specialist for more details.

Alarm 0x0101 – excess temperature

8878

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	device temperature in [°C]															

Alarm 0x0104 – Manual output control was activated

18997

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Manual output control was recognised															

Alarm 0x0200 – internal system error in the AS-i master

8879

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	已保留															M
1	cause of error															

Legend:

M	master no.	1 bit	0 = AS-i master 1 1 = AS-i master 2

Please ask your AS-i specialist for more details.

Alarm 0x0202 – AS-i master set to the projection mode

8881

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	已保留															M

Legend:

M	master no.	1 bit	0 = AS-i master 1 1 = AS-i master 2

Alarm 0x0203 – new slave 0 was detected

8882

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	已保留															M

Legend:

M	master no.	1 bit	0 = AS-i master 1 1 = AS-i master 2

Alarm 0x0204 – earth fault detected

8883

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	已保留															M
1	Symmetry															

Legend:

M	master no.	1 bit	0 = AS-i master 1 1 = AS-i master 2

Alarm 0x0207 – 22.5 V AS-i power failure detected

8886

Supply voltage of the AS-i master dropped below 22.5 V.

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	已保留															M

Legend:

M	master no.	1 bit	0 = AS-i master 1 1 = AS-i master 2

Alarm 0x0208 – 19 V AS-i power failure detected

8887

Supply voltage of the AS-i master dropped below 19 V.

Offset Word no.	bit															
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	已保留															M

Legend:

M	master no.	1 bit	0 = AS-i master 1 1 = AS-i master 2

Alarm 0x03ss – configuration error, too many slaves

9218

Alarm type ID		Slave address
[dec]	[hex]	
769	0301	1(A)
770	0302	2(A)
771	0303	3(A)
772	0304	4(A)
773	0305	5(A)
774	0306	6(A)
775	0307	7(A)
776	0308	8(A)
777	0309	9(A)
778	030A	10(A)
779	030B	11(A)
780	030C	12(A)
781	030D	13(A)
782	030E	14(A)
783	030F	15(A)
784	0310	16(A)
785	0311	17(A)
786	0312	18(A)
787	0313	19(A)
788	0314	20(A)
789	0315	21(A)
790	0316	22(A)
791	0317	23(A)
792	0318	24(A)
793	0319	25(A)
794	031A	26(A)
795	031B	27(A)
796	031C	28(A)
797	031D	29(A)
798	031E	30(A)
799	031F	31(A)

Alarm type ID		Slave address
[dec]	[hex]	
801	0321	1B
802	0322	2B
803	0323	3B
804	0324	4B
805	0325	5B
806	0326	6B
807	0327	7B
808	0328	8B
809	0329	9B
810	032A	10B
811	032B	11B
812	032C	12B
813	032D	13B
814	032E	14B
815	032F	15B
816	0330	16B
817	0331	17B
818	0332	18B
819	0333	19B
820	0334	20B
821	0335	21B
822	0336	22B
823	0337	23B
824	0338	24B
825	0339	25B
826	033A	26B
827	033B	27B
828	033C	28B
829	033D	29B
830	033E	30B
831	033F	31B

Alarm 0x04ss – configuration error, slave is missing

9223

Alarm type ID		Slave address
[dec]	[hex]	
1025	0401	1(A)
1026	0402	2(A)
1027	0403	3(A)
1028	0404	4(A)
1029	0405	5(A)
1030	0406	6(A)
1031	0407	7(A)
1032	0408	8(A)
1033	0409	9(A)
1034	040A	10(A)
1035	040B	11(A)
1036	040C	12(A)
1037	040D	13(A)
1038	040E	14(A)
1039	040F	15(A)
1040	0410	16(A)
1041	0411	17(A)
1042	0412	18(A)
1043	0413	19(A)
1044	0414	20(A)
1045	0415	21(A)
1046	0416	22(A)
1047	0417	23(A)
1048	0418	24(A)
1049	0419	25(A)
1050	041A	26(A)
1051	041B	27(A)
1052	041C	28(A)
1053	041D	29(A)
1054	041E	30(A)
1055	041F	31(A)

Alarm type ID		Slave address
[dec]	[hex]	
1057	0421	1B
1058	0422	2B
1059	0423	3B
1060	0424	4B
1061	0425	5B
1062	0426	6B
1063	0427	7B
1064	0428	8B
1065	0429	9B
1066	042A	10B
1067	042B	11B
1068	042C	12B
1069	042D	13B
1070	042E	14B
1071	042F	15B
1072	0430	16B
1073	0431	17B
1074	0432	18B
1075	0433	19B
1076	0434	20B
1077	0435	21B
1078	0436	22B
1079	0437	23B
1080	0438	24B
1081	0439	25B
1082	043A	26B
1083	043B	27B
1084	043C	28B
1085	043D	29B
1086	043E	30B
1087	043F	31B

Alarm 0x05ss – configuration error, slave has an incorrect profile

9224

Alarm type ID		Slave address
[dec]	[hex]	
1281	0501	1(A)
1282	0502	2(A)
1283	0503	3(A)
1284	0504	4(A)
1285	0505	5(A)
1286	0506	6(A)
1287	0507	7(A)
1288	0508	8(A)
1289	0509	9(A)
1290	050A	10(A)
1291	050B	11(A)
1292	050C	12(A)
1293	050D	13(A)
1294	050E	14(A)
1295	050F	15(A)
1296	0510	16(A)
1297	0511	17(A)
1298	0512	18(A)
1299	0513	19(A)
1300	0514	20(A)
1301	0515	21(A)
1302	0516	22(A)
1303	0517	23(A)
1304	0518	24(A)
1305	0519	25(A)
1306	051A	26(A)
1307	051B	27(A)
1308	051C	28(A)
1309	051D	29(A)
1310	051E	30(A)
1311	051F	31(A)

Alarm type ID		Slave address
[dec]	[hex]	
1313	0521	1B
1314	0522	2B
1315	0523	3B
1316	0524	4B
1317	0525	5B
1318	0526	6B
1319	0527	7B
1320	0528	8B
1321	0529	9B
1322	052A	10B
1323	052B	11B
1324	052C	12B
1325	052D	13B
1326	052E	14B
1327	052F	15B
1328	0530	16B
1329	0531	17B
1330	0532	18B
1331	0533	19B
1332	0534	20B
1333	0535	21B
1334	0536	22B
1335	0537	23B
1336	0538	24B
1337	0539	25B
1338	053A	26B
1339	053B	27B
1340	053C	28B
1341	053D	29B
1342	053E	30B
1343	053F	31B

Alarm 0x06ss – periphery fault

9225

Alarm type ID		Slave address
[dec]	[hex]	
1537	0601	1(A)
1538	0602	2(A)
1539	0603	3(A)
1540	0604	4(A)
1541	0605	5(A)
1542	0606	6(A)
1543	0607	7(A)
1544	0608	8(A)
1545	0609	9(A)
1546	060A	10(A)
1547	060B	11(A)
1548	060C	12(A)
1549	060D	13(A)
1550	060E	14(A)
1551	060F	15(A)
1552	0610	16(A)
1553	0611	17(A)
1554	0612	18(A)
1555	0613	19(A)
1556	0614	20(A)
1557	0615	21(A)
1558	0616	22(A)
1559	0617	23(A)
1560	0618	24(A)
1561	0619	25(A)
1562	061A	26(A)
1563	061B	27(A)
1564	061C	28(A)
1565	061D	29(A)
1566	061E	30(A)
1567	061F	31(A)

Alarm type ID		Slave address
[dec]	[hex]	
1569	0621	1B
1570	0622	2B
1571	0623	3B
1572	0624	4B
1573	0625	5B
1574	0626	6B
1575	0627	7B
1576	0628	8B
1577	0629	9B
1578	062A	10B
1579	062B	11B
1580	062C	12B
1581	062D	13B
1582	062E	14B
1583	062F	15B
1584	0630	16B
1585	0631	17B
1586	0632	18B
1587	0633	19B
1588	0634	20B
1589	0635	21B
1590	0636	22B
1591	0637	23B
1592	0638	24B
1593	0639	25B
1594	063A	26B
1595	063B	27B
1596	063C	28B
1597	063D	29B
1598	063E	30B
1599	063F	31B

Alarm 0x07ss – double addressing fault

9219

Alarm type ID		Slave address
[dec]	[hex]	
1793	0701	1
1794	0702	2
1795	0703	3
1796	0704	4
1797	0705	5
1798	0706	6
1799	0707	7
1800	0708	8
1801	0709	9
1802	070A	10
1803	070B	11
1804	070C	12
1805	070D	13
1806	070E	14
1807	070F	15
1808	0710	16
1809	0711	17
1810	0712	18
1811	0713	19
1812	0714	20
1813	0715	21
1814	0716	22
1815	0717	23
1816	0718	24
1817	0719	25
1818	071A	26
1819	071B	27
1820	071C	28
1821	071D	29
1822	071E	30
1823	071F	31

Step7 programmer's notes

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Diagnostics alarm procedure:

1. As soon as a device has detected a diagnostics alarm, the alarm is automatically forwarded to the fieldbus controller.
2. When a diagnostics alarm arrives in the fieldbus controller, an interrupt of the cyclic program (OB1) processing is automatically generated.
3. In this case the Simatic operating system calls the OB82 (diagnostics alarm OB) which allows specific alarm processing.

The incoming and outgoing diagnostics alarms are signalled via OB82.

► Create OB82 (can be empty).

> If OB82 does not exist, the S7 goes into the STOP state at each alarm.

► The LED [SF] on the S7 starts to light at the first incoming alarm and goes out with the last outgoing alarm.

8.8 OSC messages

内容

18959

This section contains information about the messages for events, warnings and faults of the AC140n.

8.8.1 OSC messages: System

15127

Message	Type	Corrective measures
An internal device error was detected <Fehlernummer>	Error	► Note the message and contact the ifm service center
Permitted temperature limit value inside the device was exceeded (<xxx.x> °C)	Warning	► Check thermal conditions of the system environment
First operation after delivery	Event	not necessary
The output control was set to <Gateway,manuell,SPS>	Event	not necessary
System power-up completed, <SW-Version>	Event	not necessary
A system reset was requested manually	Event	not necessary
The user-specific message history was deleted.	Event	not necessary
The device was reset to factory settings via <HMI, Feldbus>.	Event	not necessary
PLC used for more than 10 hours.	Event	not necessary
The project <Name> was loaded.	Event	not necessary
The PLC was set to the operating mode <Projektierungsmodus, geschützter Betrieb>.	Event	not necessary
The firmware was updated from <FW-Version> to version <FW-Version>.	Event	not necessary
The settings of the fieldbus interface were modified	Event	not necessary
The fieldbus connection was established	Event	not necessary
The fieldbus connection was aborted	Event	not necessary
The IP settings of the configuration interface were changed	Event	not necessary

8.8.2 OSC messages: AS-i 1 / AS-i 2

15128

Message	Type	Corrective measures
System errors: AS-i master <1,2>	Error	► Reboot the device If the error occurs again: ► Note the message and contact the ifm service center!
Earth fault: AS-i <1,2>	Error	► Check for earth fault of AC140n
Incorrect profile: AS-i <1,2>, slave <1(A)..31(A), 1B..31B> with profile <S-x.x.x> expected, but <S-y.y.y> found.	Error	► Check profile of the AS-i slave
Config error: AS-i <1,2>, slave <1(A)..31(A), 1B..31B> with the profile <S-x.x.x> missing	Error	► Check connections of the AS-i slave ► Reconnect AS-i slave
Config error: AS-i <1,2>, slave <1(A)..31(A), 1B..31B> with the profile <S-x.x.x> is available but not projected	Error	► Carry out projection process ([Quick setup] > [Project all])
Protocol error: AS-i <1, 2>, slave <1(A)..31(A), 1B..31B> no data transmission	Error	► Improve the transmission quality on the AS-i line
Double address detected: AS-i <1, 2>, slave <1(A)..31(A), 1B..31B>	Error	► Remove an AS-i slave with a double address from the AS-i network ► Readdress the remaining AS-i slave ► Reconnect removed AS-i slave to the AS-i network
The automatic addressing is not activated for AS-i <1,2>.	Warning	► Activate automatic addressing ([AS-i1]/[AS-i2] > [Master setup])
A voltage drop of 19.0 V was detected on AS-i master <1,2>	Warning	► Check voltage supply of the device and replace if necessary
A voltage drop of 22.5 V was detected on AS-i master <1,2>	Warning	► Check voltage supply of the device and replace if necessary
Increased message error rate: AS-i <1, 2>, slave <1(A)..31(A), 1B..31B>	Warning	► Improve the transmission quality on the AS-i line
Peripheral fault: AS-i <1, 2>, slave <1(A)..31(A), 1B..31B>	Warning	► Check displayed AS-i slave
AS-i slave with address 0 cannot be automatically readdressed (wrong profile)	Warning	► Activate automatic addressing ([AS-i1]/[AS-i2] > [Master setup]
Manual output change: AS-i <1, 2>, slave <1(A)..31(A), 1B..31B>, value: <0..F, 0..32768>	Event	not necessary
Manual parameter change: AS-i <1, 2>, slave <1(A)..31(A), 1B..31B>, value: <0..F, 0..32768>	Event	not necessary
AS-i master <1,2> was switched to the <geschützten Betrieb,Projektierungsmodus>	Event	not necessary
AS-i projection process was carried out.	Event	not necessary
AS-i slave with the address 0 was detected	Event	not necessary

8.9 Information on AS-i

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Here you will find further information for a better understanding of AS-Interface.

- E-learning program in the ifm download area:
  → www.ifm.com > [Industrial communication]
  > [AS-i Animations] > E-learning
- Literature: www.as-interface.net > [THE SYSTEM] > [Publications]

9 专业术语

A

A/B slave

AS-i slave with an A or B being appended to its address number and which may therefore be present twice on the →master.

Acyclic data transmission

In general data from the → master are transmitted once per → cycle to one each of the → slaves (= → cyclic data transmission).
Data transmission only at certain events (e.g. when the device is switched on or when values have been changed) is called acyclic data transmission.

AS-i

The AS-Interface (AS-i = Actuator Sensor Interface) is a standard for fieldbus communication to EN 50295 and IEC 62026-2. It was developed for the connection of actuators and sensors with a simple wiring to replace the conventional parallel wiring.

An unscreened two-wire yellow flat cable (max. 500 m) serves for data transmission as well as for voltage supply (24...30 V DC) for the communication electronics and for participants with a low current requirement. Loads with a greater energy requirement additionally receive a separate (black) flat cable for energy supply with 24 V DC.

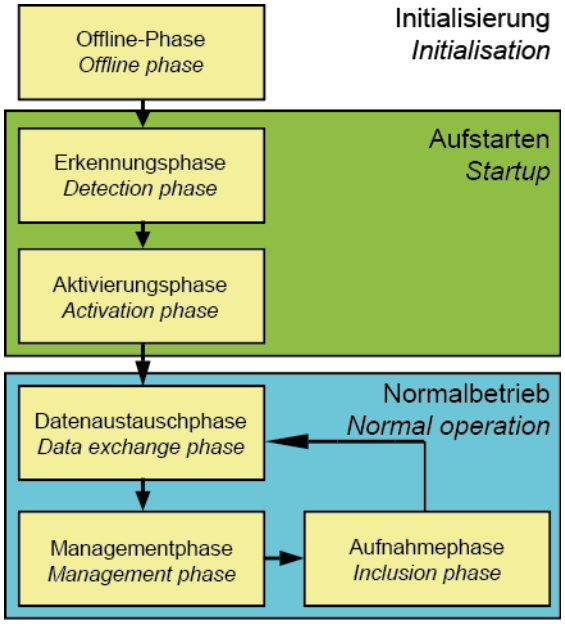
AS-Interface is a single master system. Up to 62 slaves can be connected per master. Each of these slaves needs an unambiguous address. The master cyclically polls (→Polling)) all projected slaves and exchanges the up to 248 input data and 186 output data with them.

→ www.as-interface.net AS-International Association (user association)

AS-i cycle

An AS-i cycle contains the data exchange of up to 31 slaves plus a telegram inclusion phase plus, if required, a telegram management phase (→ **AS-i phases (status machine)** (→ 页 322)). In the case of the extended addressing mode, two AS-i cycles are required for data transfer to all A/B slaves.

AS-i phases (status machine)



- Offline phase: No AS-i data traffic takes place during initialisation.
- Detection phase: In the detection phase, the AS-i master first of all searches for existing slaves - irrespective of whether they are projected or not.
- Activation phase: In this phase, the found slaves are activated depending on the operating mode.
- Data exchange phase: The AS-i master carries out cyclical data exchange with the activated slaves.
- Management phase: At the end of a cycle the AS-i master goes into the management phase, during which the master can send a command to a specific slave (if requested).
- Inclusion phase: After this, the AS-i master goes into the inclusion phase, during which it sends a command to a free slave address to detect new slaves.

ASIsafe

The name for 'Safety at Work' used by Siemens.

Assembly Instance

Assembly Instances are parameters of a logical connection (→Connection). The describe which data at which length are to be transmitted between the communication nodes.

The following Assembly Instances exist:

- Input
- Output
- Configuration

In a logical connection each of these Assembly Instances can only be used **once** . The Assembly Instance type `Configuration` must only be used once in an Assembly Instance for one and the same communication node.

B

Burst errors

Burst errors are →faults occurring depending on others. The class indicates the maximum permissible number of burst errors:
Class 1 = high protection,
Class 2 = lower protection etc.

C

CCDI

CCDI = **C**TT **C**onfiguration **D**ata **I**mage = current CTT configuration
Configuration of 7.4 and 7.5 slaves currently determined by the AS-i master:
- Manufacturer ID,
- Vendor ID,
- Device ID,
- Device Group ID.

CDI

CDI = **C**onfiguration **D**ata **I**mage = current AS-i configuration
The configuration of the connected AS-i slaves determined by the AS-i master:
LDS and AS-i profiles (IO, ID, ID1, ID2)

CIP

CIP = **C**ommon **I**ndustrial **P**rotocol
Object-oriented description of a communication protocol for industrial requirements. Presently used for the fieldbus systems DeviceNet, ControlNet and EtherNet/IP.

CODESYS

CODESYS® 是德国 3S（即 Smart Software Solutions GmbH）的注册商标。

“自动化联盟 CODESYS”将自动化行业利用广泛使用的 IEC 61131-3 开发工具 CODESYS® 对其所有硬件装置进行编程的公司联合起来。

主页 → www.codesys.com

Connection

Describes the logical connection between 2 application objects.

ControllerE

Master in the AS-i bus system of the generation E.

CTT

e.g. CTT2 = Combined Transaction Type 2
→ **Combined transaction – Use of analogue channels in the gateway depending on the slave profile** (→ 页 171)

Cycle time

This is the time for one cycle. The following happens:

- PLC cycle: The PLC program performs one complete run.
- AS-i cycle: all AS-i slaves are updated (5...10 ms).
  The cycle time mainly depends on the AS-i slaves involved in the data exchange. Message errors and management phase may extend the cycle time (⇒ no constant cycle time).

Cyclic data transmission

Data are transmitted to one slave at a time by the master once per cycle.

Cyclical polling

AS-i master cyclically polls the data of all →slaves in the →bus (see above). The data is updated in the →master after max. 5 ms. If →A/B slaves are used, the →cycle time can be extended to 10 ms.

D

Data image (AS-i)

See →process image; sum of all digital and analogue input and output data.
As regards the time, the data image represents the current condition of each individual slave and NOT a consistent image of the entire AS-i network at an exact point in time.

DeviceNet

Fieldbus system for larger data volumes based on →CAN technology, requires special cables, complex connection technology. Can be used e.g. as a supplier for AS-i over longer distances. Corresponding →gateways are available.

DHCP

DHCP = **D**ynamic **H**ost **C**onfiguration **P**rotocol = protocol for the dynamic configuration by the →host.
DHCP is a protocol that provides dynamic configuration of IP addresses and associated information. The protocol supports use of IP addresses which are only available in limited number by a centralised management of the address assignment.
The participant logs on to a server with this service when it is switched on in a network for the first time. The server assigns a local free →IP address to the participant.

DRAM

DRAM = **动**态**随**机**存**取**内**存。

随机存取电子内存 （RAM)模块技术 内存元件是可充电或放电的电容器。 可通过开关晶体管访问，可读取或由新内容覆盖。 内存内容易失： 如果工作电压缺失或重启太迟，则存储的信息丢失。

E

EDS

EDS = **E**lectronic **D**ata **S**heet
An EDS is a device description fiile in ASCII format, comparable to the GSD or the GSDML file of Profibus or Profinet.

EMC

EMC = **电**磁**兼**容**性**。

根据关于电磁兼容性的 EC 指令 (2004/108/EEC)（简称为“EMC 指令”），电气电子装置、设备、系统或组件需满足一定要求，方可在现有电磁环境下正常运行。 装置不得干扰其环境，且不可受到外部电磁干扰的不利影响。

Ethernet

以太网是广泛使用且独立于制造商的技术，有助于在网络中以 10...10 000 Mbps 的速度传送数据。 以太网属于非专属传送媒介中所谓的“最优数据传送”系列。 该概念形成于 1972 年并在 1985 年确定为 IEEE 802.3。

Explicit Messaging

Acyclic data exchange between → I/O scanner and → I/O adapter based on the TCP/IP communication protocol.

F

FC

FC = flat cable. The yellow or black AS-i cable is meant.

FE – functional earth

Functional **e**arth is a reference potential which is not connected to protective earth or only connected when special measures are taken. The functional earth serves as equalisation of potential for an ungrounded installation (e.g. →SELV).

Fieldbus

A →bus for industrial applications: mechanically extremely robust and excellent data protection.

FMEA

FMEA = **F**ailure **M**ode and **E**ffects **A**nalysis.
Method of reliability engineering, to find potential weak points. Within the framework of quality or security management, the FMEA is used preventively to prevent faults and increase the technical reliability.

FRAM

FRAM，又称 FeRAM，指**铁**电**随**机**存**取**内**存。 存储和清除操作可通过铁电层的极化变化进行。

FRAM 相比传统只读内存的优势：

- 非易失性，
- 可兼容常见的 EEPROM，但是：
- 存取时间大约为 100 ns，
- 存取周期几乎无限制。

G

Gateway

Gateway = access, coupler.
Gateways enable connection of completely different systems. Gateways are used when two incompatible network types are to be connected by converting the protocol of one system to the protocol of the other system.
Example: connection between AS-i and higher-level fieldbus systems such as →Ethernet DP, →DeviceNet, Interbus-S or other interfaces, e.g. RS-485. The device includes an AS-i master which is directly coupled to the →host interface (e.g. Ethernet DP slave).

Gateway transfer time

The time that is needed for the input data in the DP-RAM of the AS-i master to be copied into the output data of the netX, and vice versa. The distance from DP-RAM to DP-RAM is decisive.

GSD

Generic **S**tation **D**escription
Describes the interface to the device to be connected to the fieldbus.
You can find the current version of the GSD file on the **ifm** homepage:
→ www.ifm.com > [Industrial communication]
e.g. for AC1375:
→ GSD file for SmartLink AC1375
→ download the file `ifm...07E5.gsd` (... = version)

GSDML

GSDML = **G**eneric **S**tation **D**escription **M**arkup **L**anguage.
Description language which can describe the characteristics of a device family across several levels. In this XML scheme, as much as possible of the semantics of the →GSD was adopted.

H

HMI

HMI = **人机界**面

Host

The controller in the hierarchy above the AS-i master, e.g. a PLC or a processor.

I

I&M

I&M = **I**dentification **& M**aintenance
→ chapter **I&M data**
→ Profibus Profile Guidelines Part 1:
Identification & Maintenance Functions

I/O adapter

Decentralised device in an EtherNet/IP network (e.g. AC1421/AC1422)

I/O scanner

Coupling element for the connection of decentralised devices to an EtherNet/IP controller.

ID

ID = **标**识符

区分连接至系统的装置/参与者或在参与者之间传送的消息报的名称。

IEC 61131

标准： 编程逻辑控制器基础知识

- 第 1 部分： 一般信息
- 第 2 部分： 生产设备要求和测试
- 第 3 部分： 编程语言
- 第 5 部分： 通信
- 第 7 部分： 模拟控制编程

Implicit Messaging

Cyclic data exchange between → I/O scanner and → I/O adapter based on the UDP/IP communication protocol. Works based on the Producer-Consumer model, i.e. both communication nodes know the structure of the data to be exchanged before data transmission starts.

IO-Link

Point-to-point connection between 2 devices. The following transmission is possible:
- binary signals or
- greater data fields for parameter setting.

→ www.io-link.com

IP 地址

IP = **互联**网**协**议。

IP 地址是有助于清楚识别互联网参与者的编号。 为清晰起见，按照 4 个十进制值写入编号，如 127.215.205.156。

J

Jitter

Jitter means a slight fluctuation in accuracy in the transmission cycle when transmitting digital signals. More generally, jitter in transmission technology means an abrupt and undesired change of the signal characteristics.

L

LAS

List of **A**ctive →**S**laves.
In this slave list the AS-i master enters the slaves detected as active for this →master.

LDS

List of **D**etected →**S**laves.
In this slave list the AS-i master enters the slaves detected as present for this →master.

LED

LED = **发光二**极管。

发光二极管，体积小、功耗可忽略不计的高彩色亮度电子元件。

LFS

List of **F**ailed **S**laves = list of →slaves with configuration errors.
In this slave list the AS-i master enters the slaves with a projection error on this →master.

LKCS

LKCS = **L**ist of **K**nown **C**TT **S**laves

In this list the CTT slaves (profile 7.4 and 7.5) which are indicated in the LDS and whose CTT configuration has already been read are entered. This list is independent of the LDS, LPS, LAS and LNACS.

LNACS

LNACS = **L**ist of **N**ot **A**ctivated **C**TT **S**laves

In this list, the CTT slaves (profiles 7.4 and 7.5) which have been detected as CTT slaves but not activated are entered. As soon as the slave is entered in the LAS, it is deleted from this list. These slaves only take part in the data exchange until the CTT configuration has been read.

LPS

List of **P**rojected →**S**laves.
In this slave list the AS-i master enters the slaves projected for this →master.

LSB

最低**有**效**位**/字节

M

MAC-ID

MAC = **制**造商**地**址**代**码

= 制造商序列号。

→ID = **标**识符

每个网卡均有 MAC 地址，即清楚定义的全球唯一数字码，或称序列号。 该 MAC 地址由 6 个十进制数字组成，如 "00-0C-6E-D0-02-3F"。

Master-slave communication

AS-i strictly operates to the master-slave principle. The master polls all slaves one after the other in always the same order. Only one master per network line is allowed (→cyclical polling).

MBd

MegaBaud

波特 (Baud)，缩写： Bd = 数据传送速度单位。 切勿将波特与“位/秒 (bps、bits/s)”混淆。 波特表示在一定传送长度内每秒的状态 (步骤、周期) 更改量。 但未定义每步传送的位数。 Baud 一词可追溯到法国发明家 J. M. Baudot,其编码用于电传机器。

1 MBd = 1024 x 1024 Bd = 1 048 576 Bd

MMI

→ **HMI** (→ 页 327)

Modbus

The Modbus protocol is a communication protocol based on a →master/slave architecture and was generated by Modicon (since 1994: Groupe Schneider) in 1979 for communication with its PLCs. In the industry, Modbus has become a de facto standard.

Modbus/TCP is based on →Ethernet TCP/IP. Modbus/TCP ports the protocol defined for the serial interface to TCP. The →IP address clearly identifies each device in a network. Therefore the slave address was used to identify one of several logical units (unit IDs) in a physical device. To do so, the extended IP addressing is used.

Example: 192.168.83.28.1 means unit ID 1 on IP address 192.168.83.28.

MRAM

MRAM = **磁**阻**随**机**存**取**内**存

信息通过磁存储器存储。 特定材料的性质用于在接触磁场时更改其电阻。

MRAM 相比传统 RAM 内存的优势：

- 非易失性 (如 FRAM) ，但是
- 存取时间仅为 35 ns 左右，
- 存取周期无限制。

MSB

最高**有**效**位**/字节

O

OSC

OSC = **O**nline **S**upport **C**enter → **在线支持中心 (OSC)** (→ 页 141)
Help system in the device

OSSD

OSSD = **O**utput **S**ignal **S**witching **D**evice
= output signal of a safety switching device, e.g. SafetySwitch, AS-i safety monitor.

P

Password

AS-i controllerE: in the menu [System Setup], menu item [Password] the handling can be restricted or enabled. When delivered, the device is in the user mode. By entering an invalid password (e.g. 1000) all menu items which can change settings are blocked.

PCCD

PCCD = **P**rojected **C**TT **C**onfiguration **D**ata.
Configuration data for the 7.4 and 7.5 slaves stored in the device:
- manufacturer ID,
- vendor ID,
- device ID,
- device group ID.

PCD

PCD = **P**rojected **C**onfiguration **D**ata
Configuration data stored in the device: → LPS and AS-i profile (IO, ID, ID1, ID2)

PDM

PDM = **进**程和**对**话**模**块。

操作员机器/设备通信装置。

PELV

PELV = **P**rotective **E**xtra **L**ow **V**oltage
Functional extra low voltage with safe separation, grounded variant of →SELV. The specification as PELV system to IEC 364-4-41 covers a measure to protect against direct and indirect contact with dangerous voltages by a "safe separation" between primary and secondary side in the device (e.g. power supply to PELV specification).
For this reason no separate PE conductor is required in a PELV system. It is allowed to ground circuits and / or bodies in a PELV system.

PLC 配置

CODESYS 用户界面的部分

► 程序员告知编程系统哪些硬件有待编程。

> CODESYS 加载相应的库。

> 可读取和写入外围状态（输入端/输出端）。

Polling

to poll = to count votes
The controller master fetches the data from every participant in the system successively:

1. Master calls participant 1.
2. Participant 1 replies with its current data (actual values).
3. Master transfers more data (target values) to participant 1, if needed.
4. Participant 1 acknowledges reception of the data.

etc. the same procedure for each further participant.
AS-i, →cyclical polling: AS-i master cyclically polls the data of all →slaves in the →bus (see above). The data is updated in the →master after max. 5 ms. If →A/B slaves are used, the →cycle time can be extended to 10 ms.

Power-on delay time

The time required by the controller K6 from the application of the voltage supply until all of the following targets are reached:

- both AS-i networks have reached normal operation
- the master has read the configuration data of the CTTx slaves
- the field buses can use the gateway (optional)
- the PLC program was started (optional).

Profibus

PROFIBUS (**Pro**cess **Fi**eld **Bus**) is a standard for →fieldbus communication in automation technology. There are two versions of PROFIBUS, DP being the one most widely used.

- PROFIBUS-DP (decentralised periphery) for the control of sensors and actuators by a central controller in manufacturing engineering and for networking of several controllers among each other. Data rates up to 12 Mbits/s on twisted two-wire cables and/or fibre optics are possible.
- PROFIBUS-PA (process automation) is used for the control of measurement devices by a process control system in process technology and is suited for hazardous areas (zones 0 and 1). Only a limited current flows on the bus cables in an intrinsically safe circuit so that even in case of a problem no explosive sparks can occur. A disadvantage of PROFIBUS-PA is the relatively slow data transfer rate of 31.25 Kbits/s.

→ www.profibus.com (umbrella organisation)

Profinet

PROFINET (**Pro**cess **Fi**eld **Net**work) is the open Industrial Ethernet Standard of Profibus & Profinet International (PI) for automation. Profinet uses TCP/IP and IT standards, is real-time Ethernet compatible and enables the integration of fieldbus systems.

The Profinet concept has a modular design, so that the user can choose the functionality himself. This is basically different as regards the type of data exchange, to meet the requirements regarding the speed.

For Profinet, there are the two perspectives Profinet-CBA and Profinet-IO:

- Profinet-CBA (Component Based Automation) is intended for the component-based communication via TCP/IP and the real-time communication for real-time requirements in modular plant construction. Both ways of communication can be used in parallel.
- Profinet-IO has been created for real-time (RT) and synchronous communication IRT (IRT = isochronous real-time) with the decentralised periphery. The designations RT and IRT only describe the real-time characteristics in the communication within Profinet-IO.

- → www.profibus.com (umbrella organisation)

R

Redundant

Redundancy is the presence of more than the necessary means so that a function unit performs a requested function or that data can represent information.

Several kinds of redundancy are distinguished:

- Functional redundancy aims at designing safety-related systems in multiple ways in parallel so that in the event of a →failure of one component the others ensure the task.
- In addition it is tried to separate redundant systems from each other with regard to space. Thus the →risk that they are affected by a common interference is minimised.
- Finally, components from different manufacturers are sometimes used to avoid that a systematic fault causes all redundant systems to fail (→diverse redundancy).

The software of redundant systems should differ in the following aspects:
- specification (different teams),
- specification language,
- programming (different teams),
- programming language,
- compiler.

RPI

RPI = **R**equested **P**acket **I**ntervall

RTC

RTC = **实**时**时钟**

提供（电池支持）当前的日期和时间。 常用于存储错误消息协议。

RTS

RTS = **R**un**t**ime **S**ystem
Runtime systems are basic versions of applications. These minimum versions are supplied with certain products to meet the prerequisites for the execution of the actual product or to be able to look at or use results generated by this product on other processors: making available all routines required to execute a program in a programming language, e.g. interactions with the →runtime system, memory requirements, error routines, inputs and outputs.

S

SD 卡

SD 内存卡（**安**全**数**字内存卡的简称）是根据→闪速存储原理运行的数字存储媒介。

SELV

SELV = **S**afety **E**xtra **L**ow **V**oltage
Active parts of safety extra low voltage circuits must neither be connected to ground nor to protective wires of other circuits. They must be safely separated from active parts with higher voltage.
SELV circuit = secondary circuit (output voltage) which is rated and protected so that its voltages do not exceed a safe value in case of correct operation (of the power supply) or in case of a single →fault (of the power supply).
SELV circuits are separated from the input voltage (mains voltage) by double or enhanced insulation. The voltage value must not exceed 60 V DC (or 42.4 V AC).

Single slave

→Slave whose address number may only occur once on the →master.

Slave configuration

The following terms need to be distinguished...

- AS-i projected configuration (→**PCD** (→ 页 332)),
- AS-i current configuration (→**CDI** (→ 页 324)),
- CTT projected configuration (→**PCCD** (→ 页 332)),
- CTT current configuration (→**CCDI** (→ 页 324)).

T

TCP

传输**控**制**协**议是 TCP/IP 协议系列的一部分。每个 TCP/IP 数据连接均有一个变送器和一个接收器。该原理为连接导向数据传输。 在 TCP/IP 协议系列中，作为连接导向协议，TCP 承担数据保护、数据流控制的任务，并在数据丢失时采取措施。 （比较： →UDP）

U

UDP

UDP（**用**户**数**据报**协**议）是最低限度无连接网络协议，属于网络协议系列中的传输层。 UDP 的任务是确保通过互联网传输的数据传送给适当的应用。
目前可实施基于 →CAN 和 UDP 的网络变量。 变量的值根据广播消息自动更换。 在 UDP 中，它们作为广播消息实施，在 CAN 中则作为 →PDO 实施。
根据协议 ,这些服务为未经确认的数据传送：未检查接收器是否接收消息。网络变量交换对应“1 到 n 个连接”（1 个变送器到 n 个接收器）。

Unit ID

→Modbus

四划

从站

总线上的被动参与者，仅依赖→主站的请求。 在总线中，从站有明确定义且唯一的→地址。

五划

主站

处理总线的整体安排。 主站决定总线访问时间并定期→轮询从站。

电子狗

一般而言，“电子狗”一词表示监控其他组件功能的系统组件。 如果检测到可能的故障，则向其发送信号或启用相应的程序分支。 信号或程序分支作为其他协作系统组件的触发器，以解决问题。

目标

目标包含 CODESYS 目标装置的硬件说明，如： 输入端和输出端、内存、文件位置。
对应电子技术资料。

闪存

快闪 ROM (或快闪 EPROM 或闪存) 将半导体内存和硬盘的优势相结合。 但是跟硬盘类似，数据在高达 64、128、256、1024... 字节的数据块中同时按区块写入和删除。

闪存的优势

- 即便无电源电压亦可保留存储的数据。
- 因为没有移动部件，闪存无噪音且对冲击和磁场不敏感。

闪存的劣势

- 存储单元可容许有限数量的写入和删除进程：
  - 多级单元： 一般为 10 000 个周期
  - 单级单元： 一般为 100 000 个周期
- 鉴于写入进程同时写入 16 和 128 K 字节之间的内存块，还可使用无需更改的内存单元。

六划

地址

这是总线参与者的“名称”。 所有参与者需要唯一的地址，以便无忧更换信号。

自检

主动检验组件或装置的检验程序。 程序由用户启动，且将花费一定的时间。 结果为显示检验内容以及结果为正面还是负面的检验协议（日志文件）。

七划

应用程序软件

针对应用程序的软件，由机器制造商实施，一般包含控制相应输入端、输出端计算和决策的逻辑序列、限制和表达式。

系统变量

可通过 IEC 地址或符号名称从 PLC 访问的变量。

诊断

诊断期间，检查装置的“健康状态”。 从而将发现装置是否存在→以及存在何种故障。

还可监控输入端和输入端是否正常运行，具体视装置而定。

- 断线，
- 短路，
- 值在范围之外。

就诊断而言，可使用装置“正常”运行期间创建的配置和日志数据。
初始化和启动期间可监控系统组件是否正确启动。 日志文件记录错误。
就进一步诊断而言，还可进行自检。

运行时系统

装置中的基本程序，建立装置硬件和应用程序之间的连接。

进程图像

进程图像即在一个→周期内 PLC 据其运行的输入端和输出端状态。

- 在周期开始时，PLC 将所有输入端的状况读取至进程图像。
  周期期间，PLC 无法检测输入端的更改。
- 周期期间，仅可对输出端进行虚拟更改（在进程图像中）。
- 在周期结束时，PLC 将虚拟输出状态写入实际输出端。

连接指令

连接指令是指对文件中其他部分或外部文件的交叉引用。

八划

使用，指定

根据用途说明所载的信息使用产品。

固件

装置中的系统软件、基本程序，实际上→是运行时系统中。
固件建立装置硬件和应用程序之间的连接。 固件作为系统的一部分由控制器制造商提供，且用户不可更改。

图标

图标即通过简化的图示传达信息的象征性符号。 (→ 章节 **符号和格式是什么意思？**)

波特

波特 (Baud)，缩写： Bd = 数据传送速度单位。 切勿将波特与“位/秒 (bps、bits/s)”混淆。 波特表示在一定传送长度内每秒的状态（步骤、周期）更改量。 但未定义每步传送的位数。 Baud 一词可追溯到法国发明家 J. M. Baudot,其编码用于电传机器。
1 MBd = 1024 x 1024 Bd = 1 048 576 Bd

九划

总线

同一电缆上多个参与者的串行数据传送.

指定用途

根据用途说明所载的信息使用产品。

架构

系统硬件和/或软件的特定配置。

说明

以下术语之一的上义词：
安装说明、技术资料、用户信息、操作说明、装置手册、安装信息、联机帮助、系统手册、编程手册等。

十一划

符号

图标即通过简化的图示传达信息的象征性符号。 (→ 章节 **符号和格式是什么意思？**)

十二划

剩余

电源故障时剩余数据不会丢失。
当电源电压跌破关键值时→运行时系统等即会自动将剩余数据复制到→闪存。 如果电源电压再次可用，则运行时系统将剩余数据加载回 RAM 内存。
但是控制器 RAM 内存中的数据易失，通常会在电源故障时丢失。

十三划

数据类型

可存储不同大小的值，具体式数据类型而定。

数据类型	最小值	最大值	内存大小
BOOL	FALSE	TRUE	8 位 = 1 个字节
BYTE	0	255	8 位 = 1 个字节
WORD	0	65 535	16 位 = 2 个字节
DWORD	0	4 294 967 295	32 位 = 4 个字节
SINT	-128	127	8 位 = 1 个字节
USINT	0	255	8 位 = 1 个字节
INT	-32 768	32 767	16 位 = 2 个字节
UINT	0	65 535	16 位 = 2 个字节
DINT	-2 147 483 648	2 147 483 647	32 位 = 4 个字节
UDINT	0	4 294 967 295	32 位 = 4 个字节
REAL	$-3.402823466 \cdot 10^{38}$	$3.402823466 \cdot 10^{38}$	32 位 = 4 个字节
ULINT	0	18 446 744 073 709 551 615	64 位 = 8 个字节
STRING			字符数量 + 1

10 索引

A

B

C

D

E

F

G

H

I

索引

J

L

M

O

P

R

S

T

U

V

W

二划

三划

四划

五划

六划

七划

八划

九划

十划

十一划

十二划

十三划

十四划

十五划

十六划

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