

# AS-i 3.0 PROFIBUS Gateways

## Operating Manual



DP V0 and DP V1



AS-i 3.0 Specification

Subject to modifications.

Reproduction, duplication and/or translation is not permitted.

Products, symbols and names are normally quoted here without reference to existing patent, registered utility models or trademarks.

The lack of any such reference does not justify the assumption that a product, symbol or name is free of rights.

# Table of Contents

## AS-i 3.0 PROFIBUS Gateways

	<b>Operating Manual .....</b>	<b>1</b>
	Table of Contents .....	3
	<b>Declaration of Conformity.....</b>	<b>9</b>
<b>1</b>	<b>The Explanation of Symbols .....</b>	<b>10</b>
<b>1.1</b>	<b>Abbreviations .....</b>	<b>10</b>
<b>2</b>	<b>Safety .....</b>	<b>11</b>
<b>2.1</b>	<b>Intended use .....</b>	<b>11</b>
<b>2.2</b>	<b>General safety information .....</b>	<b>11</b>
<b>2.3</b>	<b>Waste disposal .....</b>	<b>11</b>
<b>3</b>	<b>General Information .....</b>	<b>12</b>
<b>3.1</b>	<b>Product information .....</b>	<b>12</b>
<b>3.2</b>	<b>AS-i Specification 3.0 .....</b>	<b>13</b>
<b>3.3</b>	<b>Accessories .....</b>	<b>13</b>
<b>3.4</b>	<b>Technical data .....</b>	<b>14</b>
<b>3.5</b>	<b>Declaration of conformity .....</b>	<b>14</b>
<b>3.6</b>	<b>Certification according to DIN EN ISO 9001 : 2000 .....</b>	<b>14</b>
<b>3.7</b>	<b>Information about Hazardous Locations .....</b>	<b>15</b>
<b>3.7.1</b>	Devices with Class I Div. 2 marking .....	15
<b>4</b>	<b>Mounting Instructions .....</b>	<b>16</b>
<b>4.1</b>	<b>Size .....</b>	<b>16</b>
<b>4.2</b>	<b>Mounting .....</b>	<b>16</b>
<b>4.3</b>	<b>Electrical connection .....</b>	<b>16</b>
<b>4.4</b>	<b>Commissioning of PROFIBUS Single Master .....</b>	<b>17</b>
<b>4.4.1</b>	Advanced display mode .....	17
<b>4.4.2</b>	Setting the PROFIBUS DP Address .....	17
<b>4.4.3</b>	Connecting AS-i Slaves .....	18
<b>4.4.4</b>	Quick Setup .....	19
<b>4.4.4.1</b>	Error tracing .....	20
<b>4.4.4.2</b>	Faulty slaves .....	20
<b>4.4.4.3</b>	Error display (last error) .....	20
<b>4.4.4.4</b>	Addressing .....	21
<b>4.4.4.5</b>	Programming slave 2 to address 6 .....	21
<b>4.5</b>	<b>Commissioning of PROFIBUS Double Master .....</b>	<b>22</b>
<b>4.5.1</b>	Advanced display mode .....	22
<b>4.5.2</b>	Setting the PROFIBUS DP address .....	22
<b>4.5.3</b>	Connecting AS-i Slaves .....	23
<b>4.5.4</b>	Quick Setup .....	24
<b>4.5.4.1</b>	Error tracing .....	25

4.5.4.2	Faulty slaves .....	25
4.5.4.3	Error display (last error) .....	25
4.5.4.4	Addressing .....	26
4.5.4.5	Programming slave 2 to address 6 .....	26
<b>4.6</b>	<b>Commissioning of PROFIBUS Basic Master .....</b>	<b>27</b>
4.6.1	Setting the PROFIBUS-DP address .....	27
4.6.1.1	Switching to configuration mode .....	28
4.6.2	Connecting AS-i Slaves .....	28
4.6.3	Store AS-i configuration .....	29
4.6.4	Error tracing .....	30
4.6.5	Faulty slaves (one error) .....	30
4.6.5.1	Faulty slaves (multiple errors) .....	30
4.6.6	Error display (last error) .....	31
4.6.7	Addressing .....	31
4.6.8	Delete slave address 5 .....	31
4.6.9	Programming of slave 0 to address 4 .....	32
<b>5</b>	<b>Electrical Connection .....</b>	<b>33</b>
<b>5.1</b>	<b>Overview of connections, displays and operating keys .....</b>	<b>33</b>
<b>5.2</b>	<b>AS-i bus connection .....</b>	<b>33</b>
<b>5.3</b>	<b>Information about the device types .....</b>	<b>34</b>
<b>5.4</b>	<b>Power supply and AS-i terminal assignment .....</b>	<b>34</b>
5.4.1	Electrical connection of single master .....	35
5.4.2	Electrical connection of single master with decoupling network .....	36
5.4.3	Electrical connection of double master .....	37
5.4.4	Electrical connection of double master in version "1 power supply, 1 gateway for 2 AS-i circuits" .....	38
5.4.5	Electrical connection of Basic Master .....	39
<b>5.5</b>	<b>PROFIBUS interface .....</b>	<b>39</b>
5.5.1	Terminating resistors with PROFIBUS circuit .....	40
<b>5.6</b>	<b>Display and operating elements .....</b>	<b>41</b>
5.6.1	LED-indicators .....	41
5.6.2	Push-buttons .....	41
<b>6</b>	<b>Operating in Advanced Display Mode .....</b>	<b>42</b>
<b>6.1</b>	<b>Overview .....</b>	<b>42</b>
<b>6.2</b>	<b>Navigating through the advanced display mode .....</b>	<b>44</b>
<b>6.3</b>	<b>PROFIBUS (main menu) .....</b>	<b>45</b>
6.3.1	PROFIBUS Station Address .....	45
6.3.2	PROFIBUS Status .....	45
6.3.3	SET ADDR OVER PB (Set address over PROFIBUS .....	45
6.3.4	I+M SERVICES (Information and maintenance services) .....	46
<b>6.4</b>	<b>QUICK SETUP .....</b>	<b>46</b>
<b>6.5</b>	<b>AS-i CONTROL (option) .....</b>	<b>47</b>
6.5.1	Structure of menu AS-i CONTROL .....	47
6.5.2	AS-i Control Information .....	47
6.5.3	AS-i Control Run .....	47
6.5.4	AS-i Control flags (flag memory control program) .....	48

<b>6.6</b>	<b>SLAVE ADR TOOL (Slave Addressing Tool)</b> .....	<b>48</b>
<b>6.7</b>	<b>SLAVE TEST TOOL</b> .....	<b>49</b>
<b>6.8</b>	<b>SETUP (configuration of AS-i circuit)</b> .....	<b>50</b>
6.8.1	AS-i circuit .....	50
6.8.2	Structure of menu SETUP .....	51
6.8.3	AS-I SLAVE ADR (set/change slave address) .....	52
6.8.4	FORCE OFFLINE .....	52
6.8.5	OPERATION MODE .....	52
6.8.6	STORE ACT CFG (store actual detected configuration) .....	53
6.8.7	PERMANENT PARAM (projected parameter) .....	53
6.8.8	PERMANENT CONFIG (projected configuration data) .....	53
6.8.9	AS-I ADDRESS ASSISTENT .....	54
6.8.10	LOS (list of offline slaves) .....	54
6.8.11	AUTO ADDR ENABLE (enable automatic address) .....	55
6.8.12	FACTORY RESET .....	55
<b>6.9</b>	<b>IO + PARAM. TEST</b> .....	<b>55</b>
6.9.1	AS-i circuit .....	55
6.9.2	Structure of menu IO + PARAM. TEST .....	56
6.9.3	BINARY INPUTS .....	56
6.9.4	BINARY OUTPUTS .....	57
6.9.5	ANALOG INPUTS .....	57
6.9.6	ANALOG OUTPUTS .....	58
6.9.7	PARAMETER .....	58
<b>6.10</b>	<b>DIAGNOSIS (normal AS-i Diagnosis)</b> .....	<b>58</b>
6.10.1	AS-i circuit .....	58
6.10.2	Structure of menu DIAGNOSIS .....	59
6.10.3	FLAGS .....	59
6.10.4	ACTUAL CONFIG (actual configuration) .....	61
6.10.5	LPF (list of periphery faults) .....	61
6.10.6	AS-i MASTER (info) .....	62
<b>6.11</b>	<b>ADV. DIAGNOSIS (advanced AS-i diagnosis)</b> .....	<b>62</b>
6.11.1	ERROR COUNTERS .....	62
6.11.2	LCS (list of slaves having caused a configuration error) .....	63
6.11.3	FAULT DETECTOR .....	63
<b>6.12</b>	<b>AS-i SAFETY</b> .....	<b>64</b>
6.12.1	SAFETY ORIENTED SLAVES .....	64
6.12.2	SAFETY MONITOR .....	65
6.12.3	SAFETY SUBST VAL .....	65
<b>6.13</b>	<b>LANGUAGE (language of displayed messages)</b> .....	<b>66</b>
<b>6.14</b>	<b>DISP CONTRAST (display contrast)</b> .....	<b>66</b>
<b>7</b>	<b>Advanced Diagnostics for AS-i Masters</b> .....	<b>67</b>
<b>7.1</b>	<b>List of corrupted AS-i Slaves (LCS)</b> .....	<b>67</b>
<b>7.2</b>	<b>Protocol analysis: counters of corrupted data telegrams</b> .....	<b>67</b>
<b>7.3</b>	<b>Offline Phase on Configuration Errors (LOS)</b> .....	<b>68</b>
<b>7.4</b>	<b>Functions of the AS-i Fault Detector</b> .....	<b>68</b>
7.4.1	Duplicate address' recognition .....	68
7.4.2	Earth Fault Detector .....	69
7.4.3	Noise Detector .....	69

7.4.4	Overvoltage Detector .....	69
<b>8</b>	<b>PROFIBUS DP .....</b>	<b>70</b>
<b>8.1</b>	<b>DP Telegrams .....</b>	<b>70</b>
8.1.1	Diagnosis .....	70
8.1.2	Parameters .....	73
8.1.3	Configuration DP V0 (cyclic data) .....	75
8.1.4	Options .....	75
<b>8.2</b>	<b>I/O Data .....</b>	<b>78</b>
8.2.1	Process data .....	78
8.2.2	EC-Flags and AS-i watchdog .....	79
<b>8.3</b>	<b>AS-i 16-Bit Data .....</b>	<b>80</b>
<b>8.4</b>	<b>Command Interface .....</b>	<b>81</b>
<b>8.5</b>	<b>DP V1 .....</b>	<b>81</b>
<b>8.6</b>	<b>Restrictions .....</b>	<b>82</b>
<b>9</b>	<b>Commissioning with AS-i Control Tools .....</b>	<b>83</b>
<b>9.1</b>	<b>Windows software AS-i Control Tools .....</b>	<b>83</b>
<b>9.2</b>	<b>Accessories (optional) .....</b>	<b>86</b>
9.2.1	PROFIBUS DP Master Simulator .....	86
9.2.2	Serial PROFIBUS Master .....	87
9.2.3	Analyser .....	87
9.2.4	Network extension .....	88
9.2.4.1	AS-i Repeater IP20 .....	88
9.2.4.2	AS-i Repeater IP65 .....	88
9.2.5	Power supplies .....	89
9.2.5.1	AS-i Power Supply 4 A .....	89
9.2.5.2	24 V on 30 V AS-i Power Supply in Stainless Steel 2 A .....	89
9.2.5.3	4 A/8 A Supply for AS-i Master in Stainless Steel .....	90
9.2.5.4	8 A Power supply 3 Phases for AS-i-Master in Stainless Steel .....	90
9.2.5.5	AS-i Power Extender .....	91
<b>9.3</b>	<b>Further Information .....</b>	<b>91</b>
<b>10</b>	<b>The First Commissioning of AS-i .....</b>	<b>92</b>
<b>11</b>	<b>Codes Indicated by the Display .....</b>	<b>94</b>
<b>11.1</b>	<b>Codes indicated by basic master .....</b>	<b>95</b>
<b>12</b>	<b>Appendix: Example for startup on a Siemens S7 .....</b>	<b>96</b>
<b>12.1</b>	<b>Hardware configuration .....</b>	<b>96</b>
12.1.1	Electrical connection for AS-i .....	96
12.1.2	Electrical connection for PROFIBUS-DP .....	97
<b>12.2</b>	<b>SIMATIC Step Configuration .....</b>	<b>97</b>
12.2.1	Configuration of the Hardware .....	97
12.2.2	Insert AS-i/PROFIBUS Gateway .....	100
12.2.3	Configuring AS-i/PROFIBUS-Gateway in-/output .....	103
12.2.4	AS-i/PROFIBUS Gateway PROFIBUS DP parameters .....	106
12.2.4.1	General DP parameters .....	108
12.2.4.2	Device-specific parameters .....	108

12.2.4.3	Hex parameterizing .....	112
12.2.5	SIMATIC StepS7 blocks .....	112
12.2.6	Variable table VAT_ASI_IO .....	113
12.2.6.1	AS-i flags byte 0, input bits 7 - 4 .....	115
12.2.6.2	AS-i flags byte 0, output bits 7 - 4 .....	115
12.2.7	System behavior on AS-i Config Error .....	117
<b>13</b>	<b>Installation Instruction .....</b>	<b>122</b>
<b>13.1</b>	<b>Listing of all described gateways .....</b>	<b>122</b>
<b>13.2</b>	<b>Single Master (BWU1567 ... see chapter 13.1) .....</b>	<b>123</b>
13.2.1	Dimensions .....	123
13.2.2	Front view and connections .....	124
13.2.3	Startup .....	125
13.2.3.1	Switching to advanced display mode .....	125
13.2.4	Setting the PROFIBUS-DP address .....	125
13.2.5	Connecting AS-i Slaves .....	126
13.2.6	Quick setup .....	127
13.2.7	Error tracing .....	128
13.2.7.1	Faulty slaves .....	128
13.2.7.2	Error display (last error) .....	128
13.2.8	Addressing .....	129
13.2.8.3	Program slave 0 to address 4 .....	129
13.2.9	Montage .....	130
13.2.10	Accessories .....	130
<b>13.3</b>	<b>Double Master (BWU1568 ... see chapter 13.1) .....</b>	<b>131</b>
13.3.1	Dimensions .....	131
13.3.2	Front view and connections .....	132
13.3.3	Startup .....	133
13.3.3.4	Switching to advanced display mode .....	133
13.3.4	Setting the PROFIBUS-DP address .....	133
13.3.5	Connecting AS-i Slaves .....	134
13.3.6	Quick setup .....	135
13.3.7	Error tracing .....	136
13.3.7.5	Faulty slaves .....	136
13.3.7.6	Error display (last error) .....	136
13.3.8	Addressing .....	137
13.3.8.7	Programming slave 2 to address 6 .....	137
13.3.9	Montage .....	138
13.3.10	Accessories .....	138
<b>13.4</b>	<b>Double Master (BWU1569 ... see chapter 13.1) .....</b>	<b>139</b>
13.4.1	Dimensions .....	139
13.4.2	Front view and connections .....	140
13.4.3	Startup .....	141
13.4.3.8	Switching to advanced display mode .....	141
13.4.4	Setting the PROFIBUS-DP address .....	141
13.4.5	Connect AS-i Slaves .....	142
13.4.6	Quick setup .....	143
13.4.7	Error tracing .....	144
13.4.7.9	Faulty slaves .....	144

13.4.7.10	Error display (last error) .....	144
13.4.8	Addressing .....	145
13.4.8.11	Programming slave 2 to address 6 .....	145
13.4.9	Montage .....	146
13.4.10	Accessories .....	146
<b>13.5</b>	<b>Single Master (BWU1991 ... see chapter 13.1) .....</b>	<b>147</b>
13.5.1	Dimensions .....	147
13.5.2	Front view and connections .....	148
13.5.3	Startup .....	149
13.5.3.12	Switching to advanced display mode .....	149
13.5.4	Setting the PROFIBUS-DP address .....	149
13.5.5	Connecting AS-i Slaves .....	150
13.5.6	Quick setup .....	151
13.5.7	Error tracing .....	152
13.5.7.13	Faulty slaves .....	152
13.5.7.14	Error display (last error) .....	152
13.5.8	Addressing .....	153
13.5.8.15	Program slave 2 to address 6 .....	153
13.5.9	Montage .....	154
13.5.10	Accessories .....	154
<b>13.6</b>	<b>Basic Master (BWU1746 ... see chapter 13.1) .....</b>	<b>155</b>
13.6.1	Dimensions .....	155
13.6.2	Front view and connections .....	156
13.6.3	Startup .....	157
13.6.4	Switching to configuration mode .....	157
13.6.5	Error display (last error) .....	158
13.6.6	Store AS-i configuration .....	159
13.6.7	Addressing .....	159
13.6.8	Programming slave 0 to address 4 .....	160
13.6.9	Error tracing .....	161
13.6.10	Montage .....	162
13.6.11	Accessories .....	162
<b>14</b>	<b>Glossary: AS-i Terms .....</b>	<b>163</b>
<b>15</b>	<b>Related Documents .....</b>	<b>167</b>
<b>15.1</b>	<b>Manual: "AS-i 3.0 Command Interface" .....</b>	<b>167</b>
<b>16</b>	<b>We Are Interested in Your Opinion! .....</b>	<b>168</b>



## Declaration of Conformity

according to 89/336/EEC and 73/23/EEC

Bihl+Wiedemann GmbH, Mannheim, Germany, hereby declares under its sole responsibility that the products mentioned below are in conformity with the listed harmonized standards or normative documents and (where necessary) approved by a competent body.

Designation:	<b>AS-i 3.0 PROFIBUS Gateway in Stainless Steel</b>
Article-no.:	BWU1567, BWU1568, BWU1569, BWU1746, BWU1773, BWU1891, BWU1774, BWU1599, BWU1600, BWU1601, BWU1653, BWU1654, BWU1655, BWU1775, BWU1776, BWU1777

Applied harmonized standards:	EN 50295 EN 61000-6-2 EN 61000-6-4
-------------------------------	--


Applied national standards or normative documents:	Prüfungsordnung für AS-i Master
--	---------------------------------


Manufacturer:  
Bihl+Wiedemann GmbH


Date: 01.08.05

Bernhard Wiedemann

## 1 The Explanation of Symbols

 <p><b>Warning</b></p>	<p>This symbol warns the user of possible danger. Not following this warning can lead to personal injury or death and/or destruction of the equipment.</p>
--	--

 <p><b>Attention</b></p>	<p>This symbol warns the user of a possible failure. Not following this warning can lead to total failure of the device or any other connected equipment.</p>
--	---


 <p><b>Note</b></p>	<p><i>This symbol indicates text which contains important information.</i></p>
---	--

### 1.1 Abbreviations


**AS-i** Actuator Sensor Interface


## 2 Safety

### 2.1 Intended use


 <b>Warning</b>	<p>The protection of operating personnel and the system against possible danger is not guaranteed if the control interface unit is not operated in accordance with its intended use.</p> <p>The device may only be operated by appropriately qualified personnel in accordance with this operating manual.</p>
---	--

### 2.2 General safety information

 <b>Warning</b>	<p>Safety and correct functioning of the device cannot be guaranteed if any operation other than that described in this operation manual is performed.</p> <p>Connecting the equipment and any maintenance work to be carried out with voltage applied to the equipment must exclusively be performed by appropriately qualified electrotechnical personnel.</p> <p>In case a failure cannot be repaired, the device must be taken out of operation and kept from inadvertently being put back into operation.</p> <p>Repair work is to be carried out by the manufacturer only. Additions or modifications to the equipment are not allowed and will void the warranty.</p>
---	--

 <b>Note</b>	<p>The operator is responsible for the observance of local safety standards.</p>
--	--

### 2.3 Waste disposal

	<ul style="list-style-type: none"> <li>• All devices and components are to be used properly!</li> <li>• Non-usable electrical components are hazardous waste and they should be disposed separately!</li> <li>• Local and national guide lines during waste disposal are to be respected!</li> </ul>
--	--

### 3 General Information

#### 3.1 Product information

This operating instruction holds for the following devices of the Bihl+Wiedemann GmbH:

AS-i PROFIBUS Gateway in Stainless Steel, <b>Single Master</b>	art. -no. BWU1567 art. -no. BWU1775
AS-i PROFIBUS DP Gateway in Stainless Steel, <b>Single Master</b> (with Control)	art. -no. BWU1599
AS-i PROFIBUS DP Gateway in Stainless Steel, <b>Single Master</b> (Class1Div2)	art. -no. BWU1653
AS-i PROFIBUS DP Gateway in Stainless Steel, <b>Single Master</b> (without RS232 diagnostic interface, without duplicate address' recognition)	art. -no. BWU1773
AS-i PROFIBUS DP Gateway in Stainless Steel, <b>Single Master</b> (with decoupling network)	art. -no. BWU1891
AS-i PROFIBUS Gateway in Stainless Steel, <b>Double Master</b>	art. -no. BWU1568 art. -no. BWU1776
AS-i PROFIBUS DP Gateway in Stainless Steel, <b>Double Master</b> (with Control)	art. -no. BWU1600
AS-i PROFIBUS DP Gateway in Stainless Steel, <b>Double Master</b> (Class1Div2)	art. -no. BWU1654
AS-i PROFIBUS DP Gateway in Stainless Steel, <b>Double Master</b> (without RS232 diagnostic interface, without duplicate address' recognition)	art. -no. BWU1774
AS-i/PROFIBUS Gateway in Stainless Steel, <b>Double Master</b> version "1 power supply, 1 gateway for 2 AS-i circuits"	art. -no. BWU1569 art. -no. BWU1777
AS-i PROFIBUS DP Gateway in Stainless Steel, <b>Double Master</b> (with control) version "1 power supply, 1 gateway for 2 AS-i circuits"	art. -no. BWU1601
AS-i PROFIBUS DP Gateway in Stainless Steel, <b>Double Master</b> (Class1Div2) version "1 power supply, 1 gateway for 2 AS-i circuits"	art. -no. BWU1655
AS-i PROFIBUS Gateway in Stainless Steel <b>Basic Master</b>	art. -no. BWU1746

Issue date - 10.1.2008

The AS-i PROFIBUS gateways are designated to connect AS-i systems with a superior PROFIBUS. They act as a master for the AS-i and as a slave for the PROFIBUS.

All AS-i functions are provided as well cyclically as acyclically via PROFIBUS DP V1.

In the cyclic data transfer optionally up to 32 bytes I/O data are being transferred for the binary data of one AS-i network. Additionally, analog signals and all further commands of the new AS-i specification can be transferred in the management channel via PROFIBUS.

The serial PROFIBUS Master (art. no. 1258) and the AS-i Control Tools can be used for monitoring the AS-i data online via the PROFIBUS DP V1.

### 3.2 AS-i Specification 3.0

The AS-i 3.0 Gateways already fulfil the AS-i Specification 3.0.

The previous specifications (2.1 and 2.0) are supported as well.

#### Advanced Diagnostics

Diagnostics, which go far beyond the standard diagnostics facilitate the simple detection of the occasionally occurring configuration errors and further irritations towards the AS-i communication. So in case of an error the down time of machines can be minimized or you can initiate preventive maintenance.

#### Commissioning and monitoring

The AS-i Gateway can be commissioned with the help of the software "AS-i Control Tools" in combination with the PROFIBUS Master Simulator. The device master file and type files are included in the delivery scope.

Commissioning, debugging and setting up of the AS-i parameters can also be accomplished with the use of push-buttons on the frontside of the gateway, the display and the LEDs.

### 3.3 Accessories

- Software "AS-i Control Tools" with serial cable for connection of the AS-i Master in Stainless Steel (art. no. BW1602)
- Serial PROFIBUS master (Article no. BW1258)
- PROFIBUS DP master simulator (Article no. BW1131)



Note


Please refer to <chap. 9.2 "Accessories (optional)", page 86> for further information.

### 3.4 Technical data

 <b>Note</b>	<p>The technical data are placed in the data sheet. Please view the current version on the web page: <a href="http://www.bihl-wiedemann.de/englisch/index.html">http://www.bihl-wiedemann.de/englisch/index.html</a></p>
--	--


### 3.5 Declaration of conformity

The AS-i gateways have been developed and manufactured in accordance with the applicable european standards and directives.

 <b>Note</b>	<p>The corresponding Declaration of Conformity can be found at the very beginning of this operating manual.</p>
--	---

### 3.6 Certification according to DIN EN ISO 9001 : 2000

The manufacturer of the product possesses a certified quality assurance system in accordance with ISO 9001.

 <b>Note</b>	<p>The current certificate can be viewed at <a href="http://www.bihl-wiedemann.de">http://www.bihl-wiedemann.de</a></p>
--	---


### 3.7 Information about Hazardous Locations

#### 3.7.1 Devices with Class I Div. 2 marking

The following information applies when operating this equipment in hazardous locations:

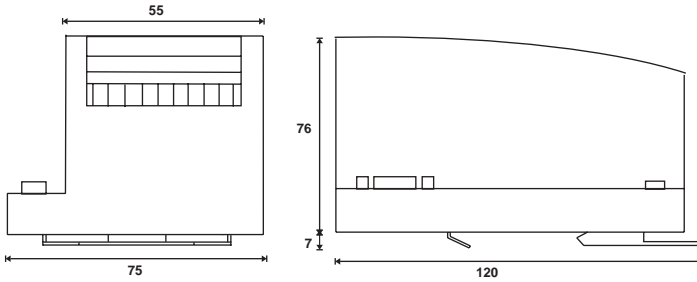
Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, hazardous locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code.

Combinations of equipment in your system are subject to investigation by the local authority having jurisdiction at the time of installation.

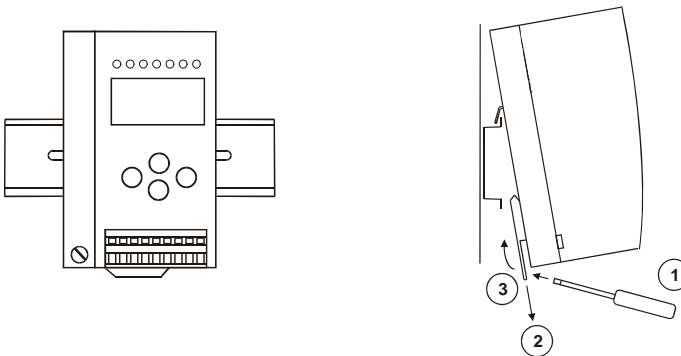
 <b>Warning</b>	<p><b>Explosion hazard</b></p> <ul style="list-style-type: none"> <li>• Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.</li> <li>• Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.</li> <li>• Only use the RS 232 connector if the area is nonhazardous.</li> <li>• Substitution of components may impair suitability for Class I, Division 2.</li> <li>• If this product contains batteries, they must only be changed in an area known to be nonhazardous.</li> </ul>
---	---

## 4 Mounting Instructions

### 4.1 Size



### 4.2 Mounting



For the mounting of the gateways in stainless steel are mounting plates with 35 mm top-hat rail intended.



Please refer to chapter "*Installation instructions*" for detailed information.

**Note**

### 4.3 Electrical connection



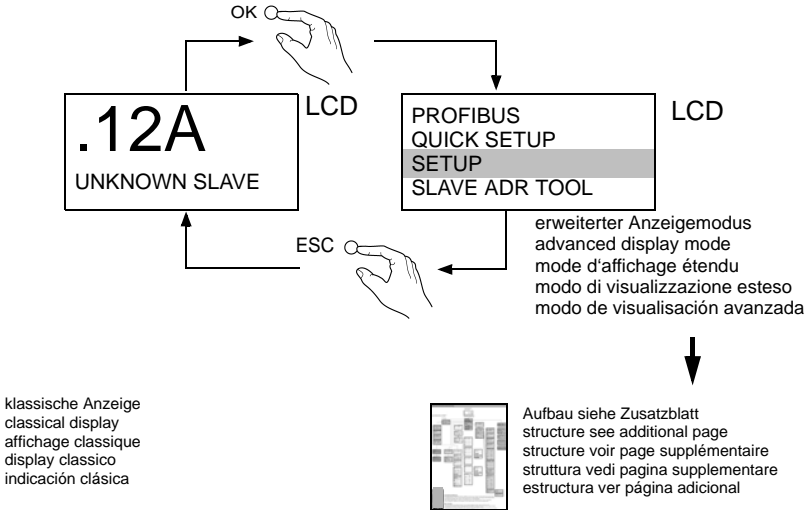
Electrical connection is illustrated in chapter "*Electrical connection*".

**Note**

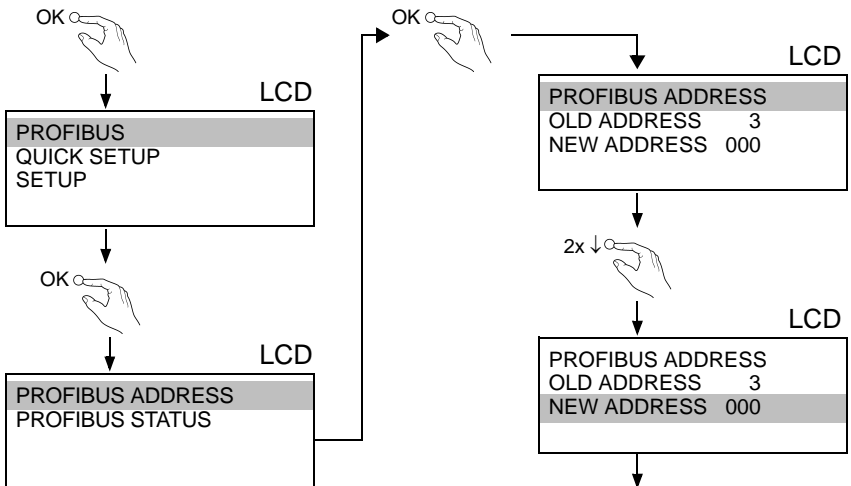


#### 4.4 Commissioning of PROFIBUS Single Master

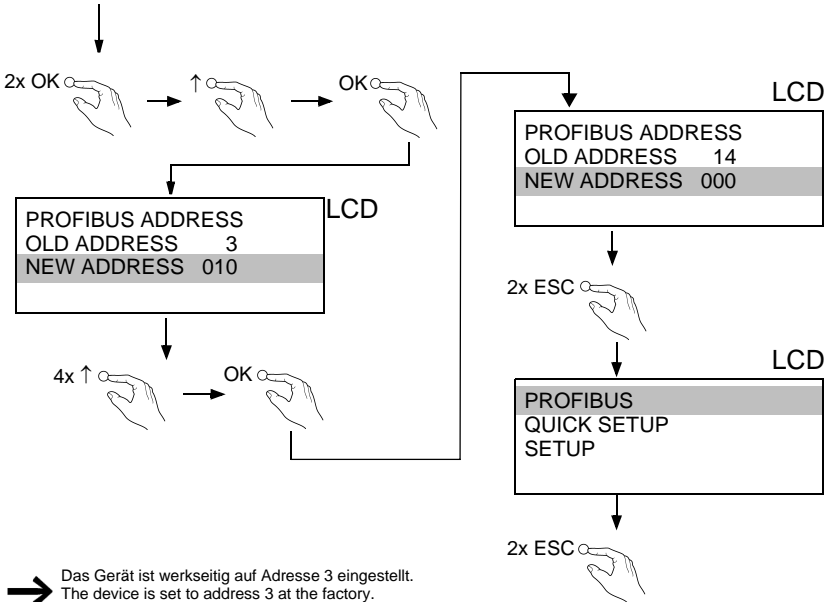
##### 4.4.1 Advanced display mode



##### 4.4.2 Setting the PROFIBUS DP Address

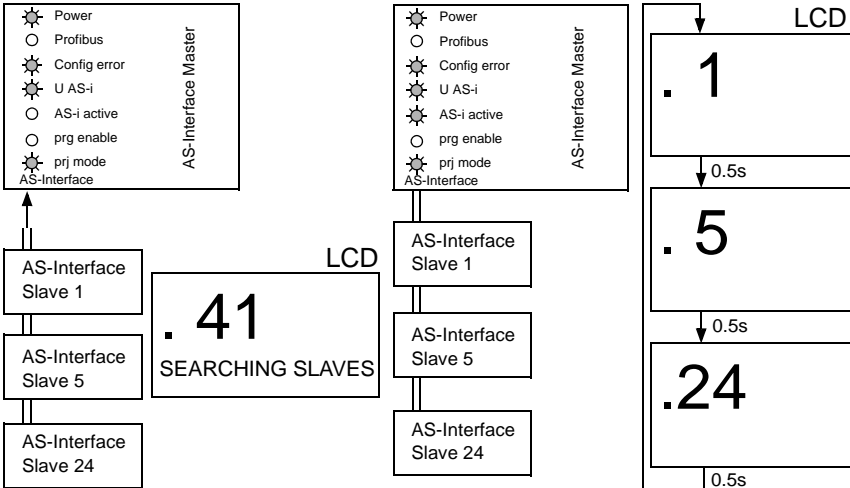


Issue date - 10.1.2008



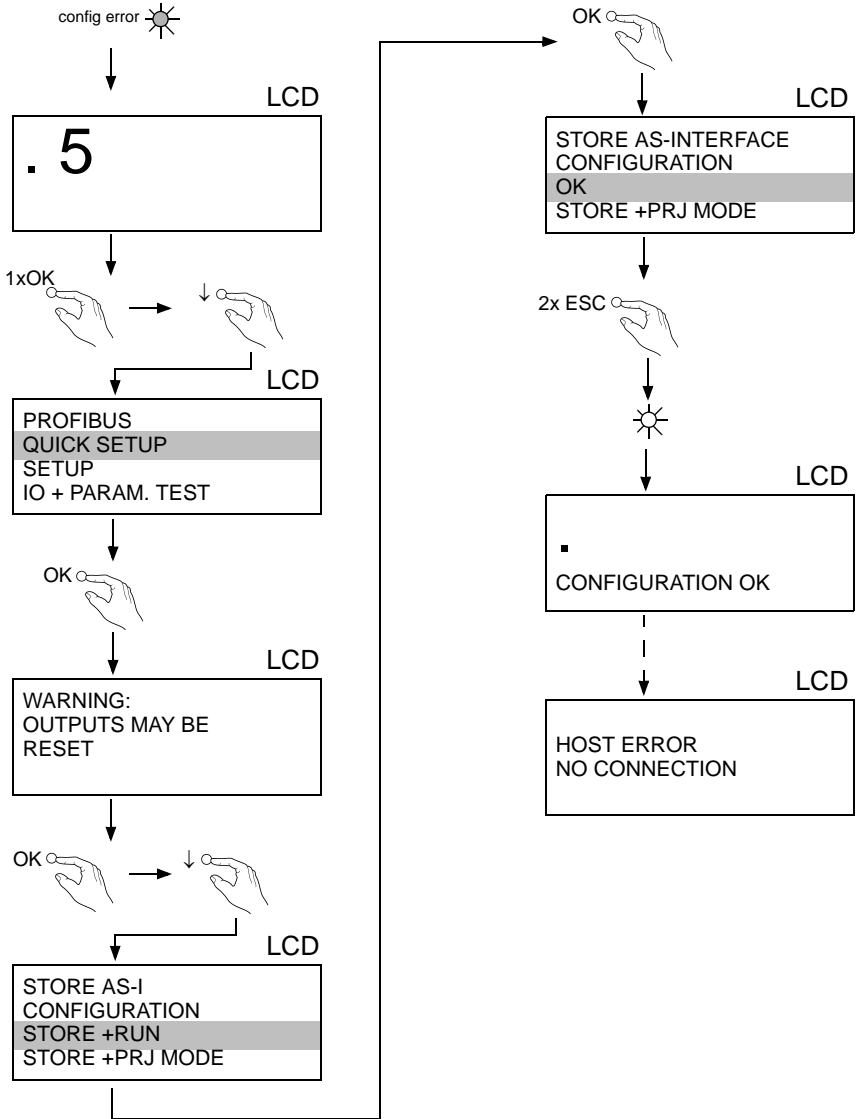
➔ Das Gerät ist werkseitig auf Adresse 3 eingestellt.  
 The device is set to address 3 at the factory.  
 L'appareil est réglé en usine à l'adresse 3.  
 L'apparecchio esce dalla fabbrica con l'indirizzo 3.  
 El aparato viene ajustado de fábrica en la dirección 3.

**4.4.3 Connecting AS-i Slaves**



Issue date - 10.1.2008

### 4.4.4 Quick Setup



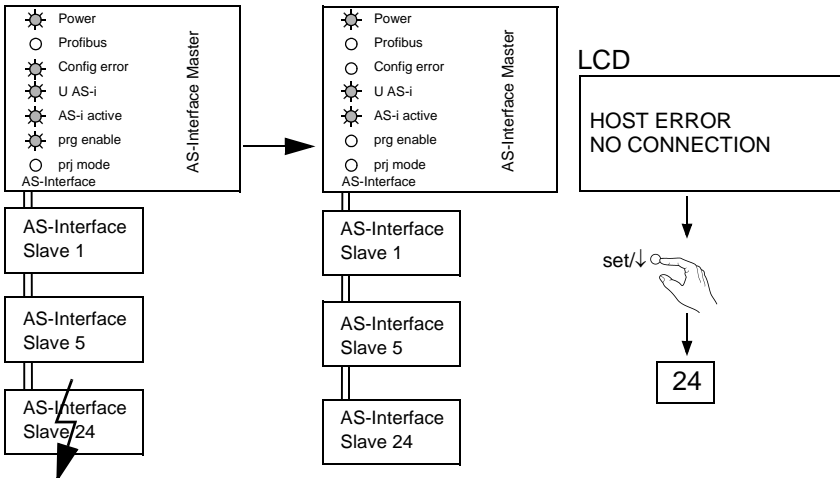
Issue date - 10.1.2008

**4.4.4.1 Error tracing**

**4.4.4.2 Faulty slaves**

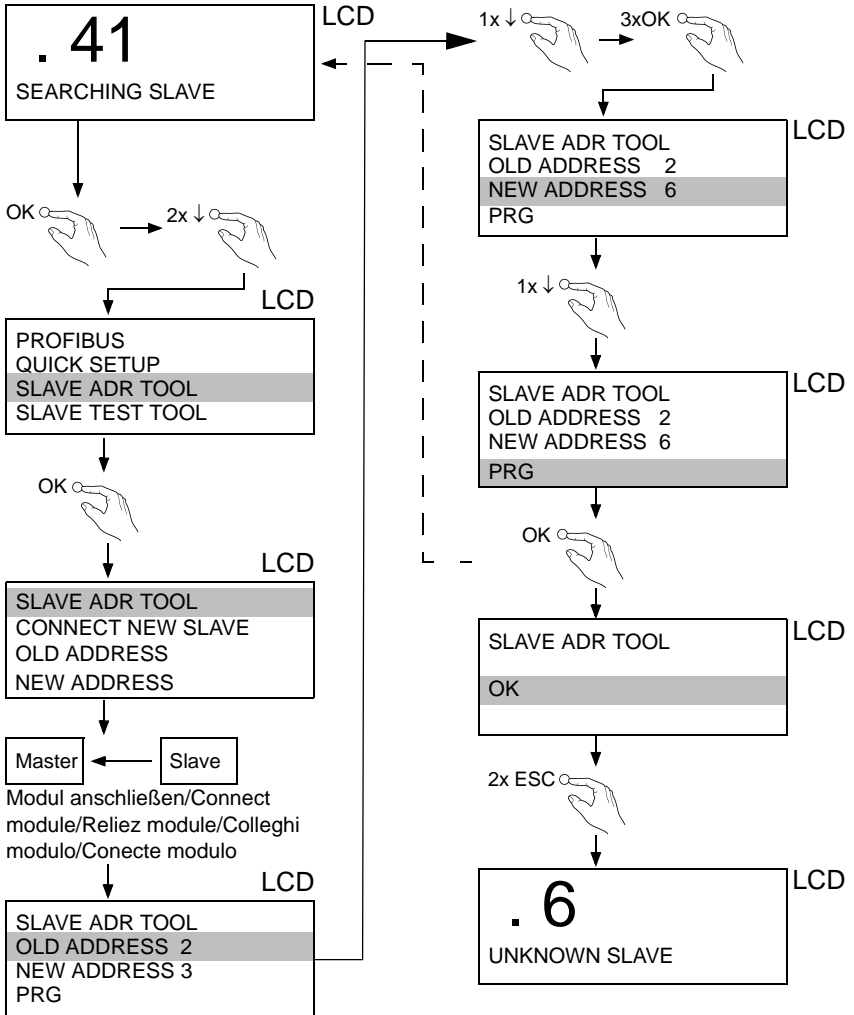


**4.4.4.3 Error display (last error)**



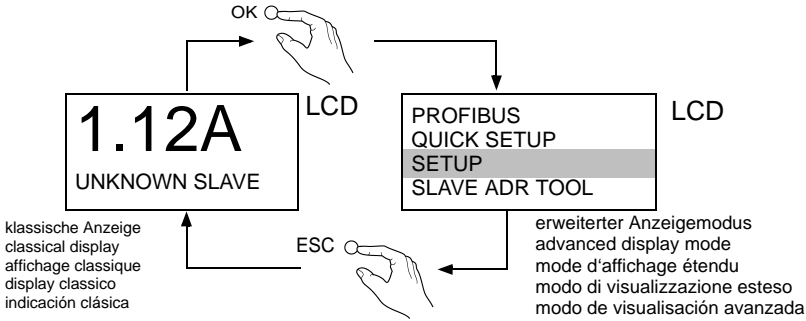
**4.4.4.4 Addressing**

**4.4.4.5 Programming slave 2 to address 6**



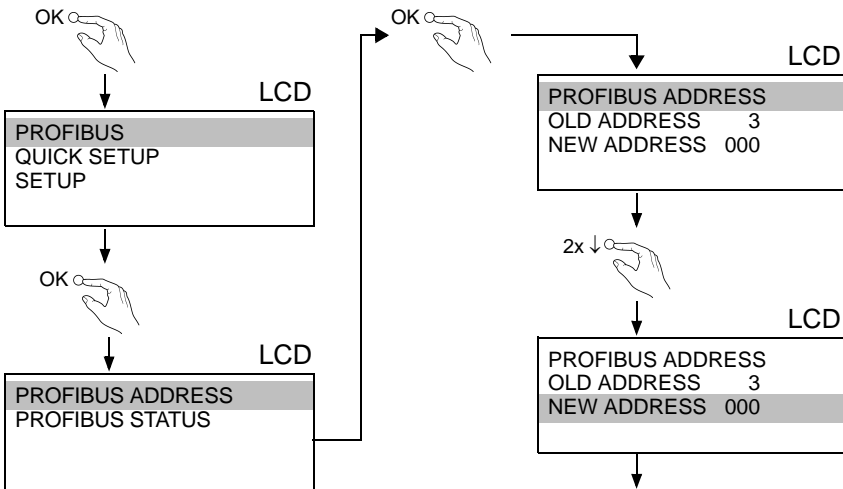
## 4.5 Commissioning of PROFIBUS Double Master

### 4.5.1 Advanced display mode

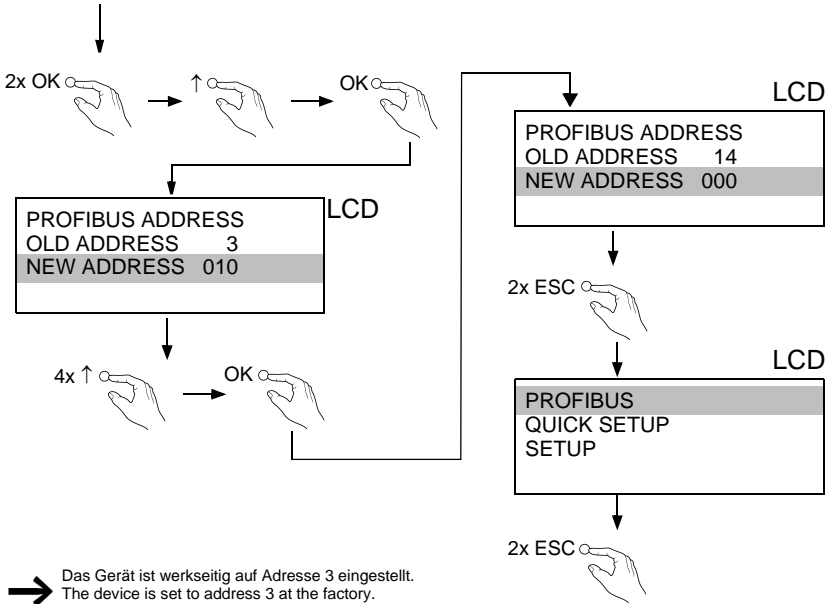


Aufbau siehe Zusatzblatt  
structure see additional page  
structure voir page supplémentaire  
struttura vedi pagina supplementare  
estructura ver página adicional

### 4.5.2 Setting the PROFIBUS DP address

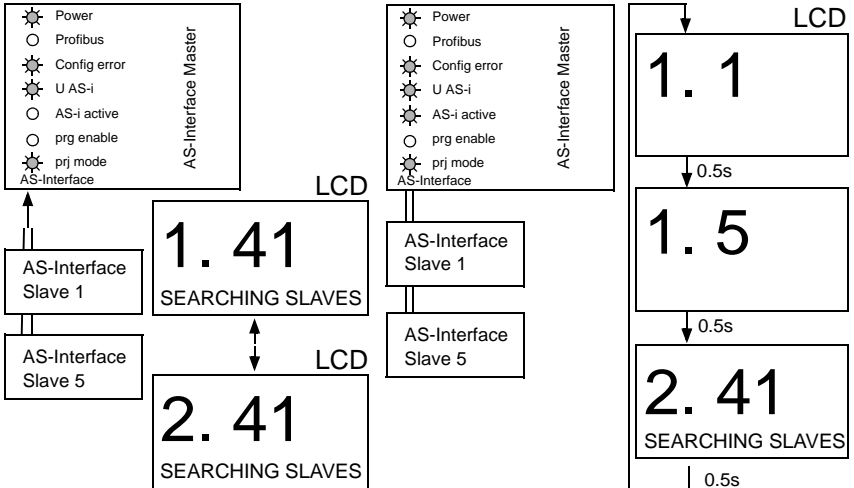


Issue date - 10.1.2008



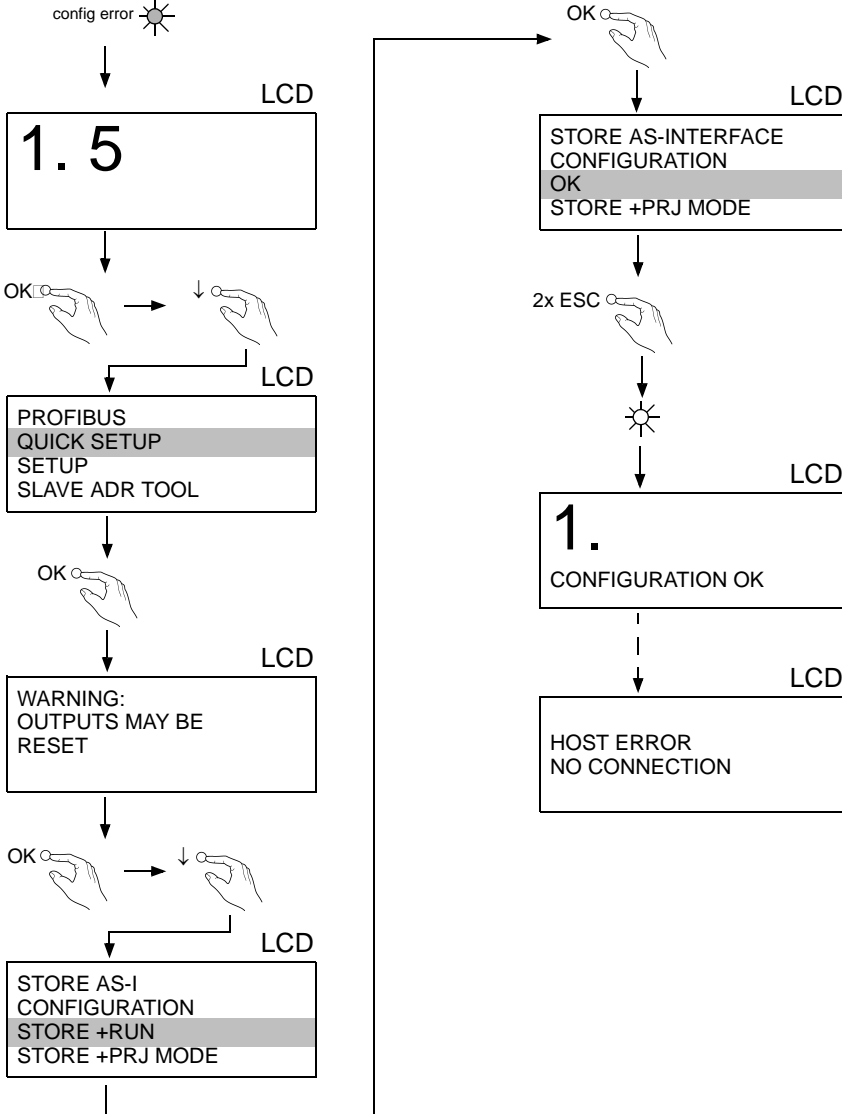
➔ Das Gerät ist werkseitig auf Adresse 3 eingestellt.  
 The device is set to address 3 at the factory.  
 L'appareil est réglé en usine à l'adresse 3.  
 L'apparecchio è messo all'indirizzo 3 dalla fabbrica.  
 El aparato viene ajustado de fábrica con la dirección 3.

**4.5.3 Connecting AS-i Slaves**



Issue date - 10.1.2008

### 4.5.4 Quick Setup



Issue date - 10.1.2008

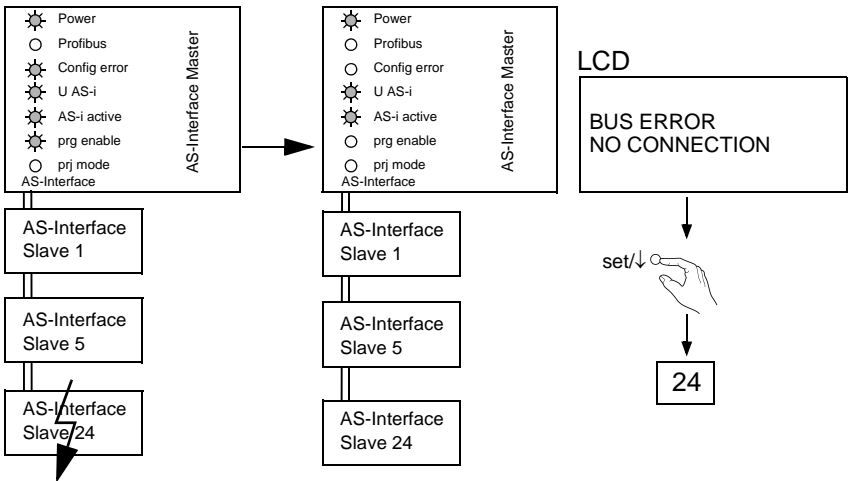


**4.5.4.1 Error tracing**

**4.5.4.2 Faulty slaves**

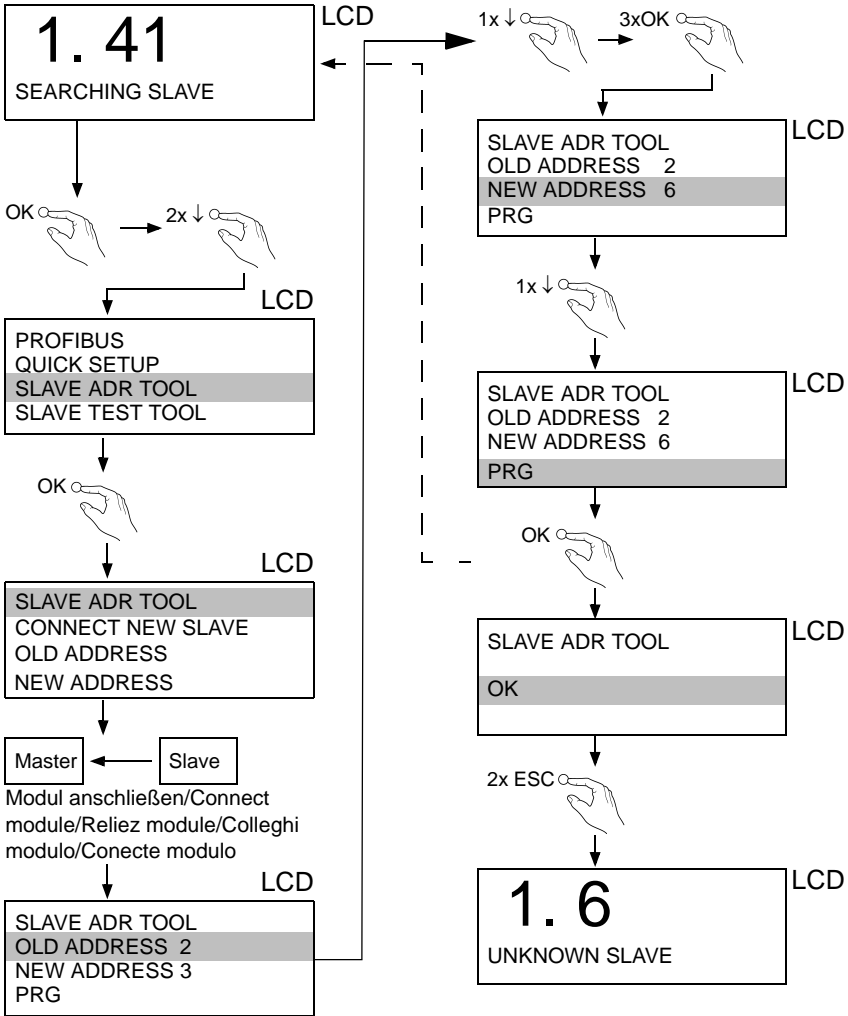


**4.5.4.3 Error display (last error)**



4.5.4.4 Addressing

4.5.4.5 Programming slave 2 to address 6



Issue date - 10.1.2008

## 4.6 Commissioning of PROFIBUS Basic Master

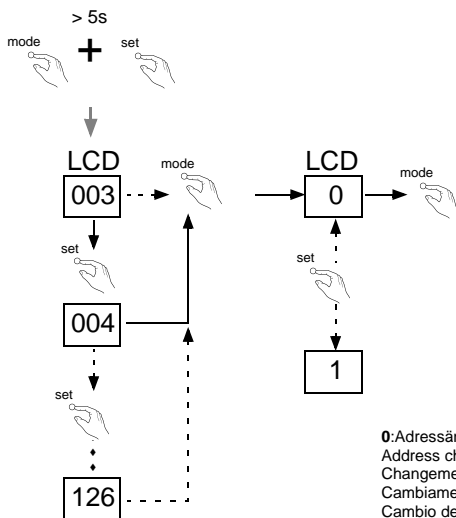


### Note

Wenn PROFIBUS aktiv, keine Konfigurationsänderung über Taster  
 If PROFIBUS active, no configuration settings by push buttons  
 Activité PROFIBUS, pas de changement de configuration via touches  
 Attività PROFIBUS, nessun cambiamento di configurazione tramite i tasti

Configuration of Basic Master is carried out by means of a 3-digit LC-Display.

### 4.6.1 Setting the PROFIBUS-DP address

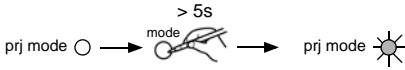


0: Adressänderung über PROFIBUS ist gesperrt (default).  
 Address change via PROFIBUS is locked (default).  
 Changement d'adresse via PROFIBUS est bloqué (default).  
 Cambiamento di indirizzo è bloccato via PROFIBUS (default).  
 Cambio de la dirección es bloqueado vía PROFIBUS (default).

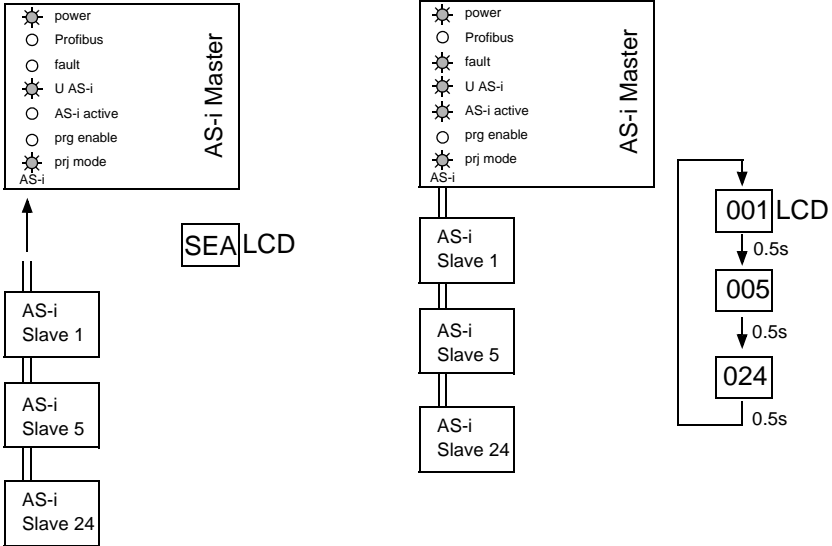
Das Gerät ist werkseitig auf Adresse 3 eingestellt.  
 The device is set to address 3 at the factory.  
 L'appareil est réglé en usine à l'adresse 3.  
 L'apparecchio è messo sull'indirizzo 3 dalla fabbrica.  
 El aparato viene ajustado de fábrica en la dirección 3.

1: Adressänderung über PROFIBUS ist erlaubt.  
 Address change via PROFIBUS is allowed.  
 Changement d'adresse via PROFIBUS est permis.  
 Cambiamento di indirizzo tramite PROFIBUS è permesso.  
 Cambio de la dirección se permite vía PROFIBUS

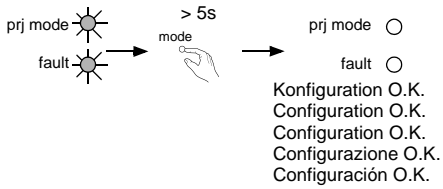
### 4.6.1.1 Switching to configuration mode



### 4.6.2 Connecting AS-i Slaves



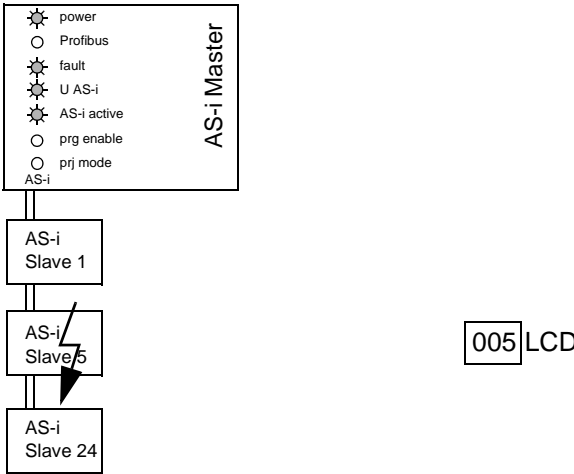
### 4.6.3 Store AS-i configuration



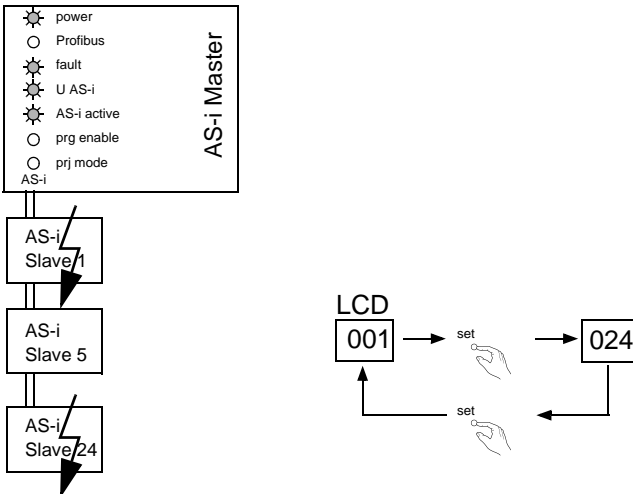
LCD  
 Kein PROFIBUS  
 No PROFIBUS  
 Aucun PROFIBUS  
 Nessun PROFIBUS  
 Ningún PROFIBUS

**4.6.4 Error tracing**

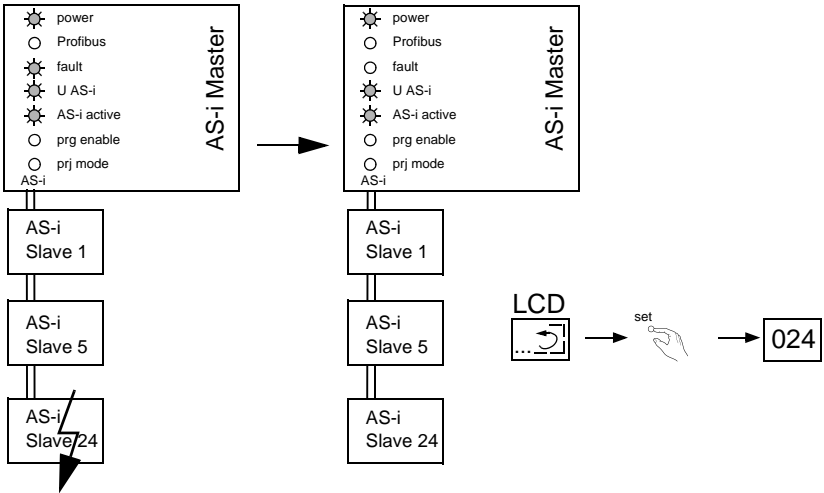
**4.6.5 Faulty slaves (one error)**



**4.6.5.1 Faulty slaves (multiple errors)**

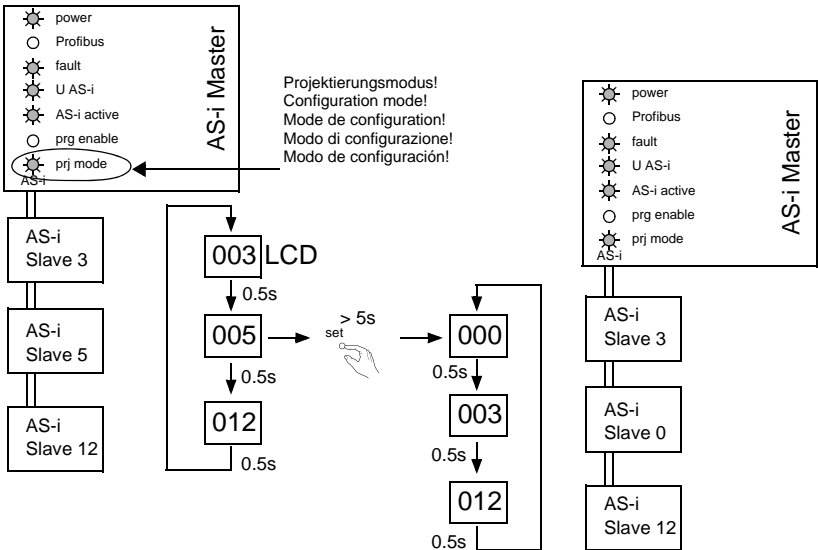


**4.6.6 Error display (last error)**

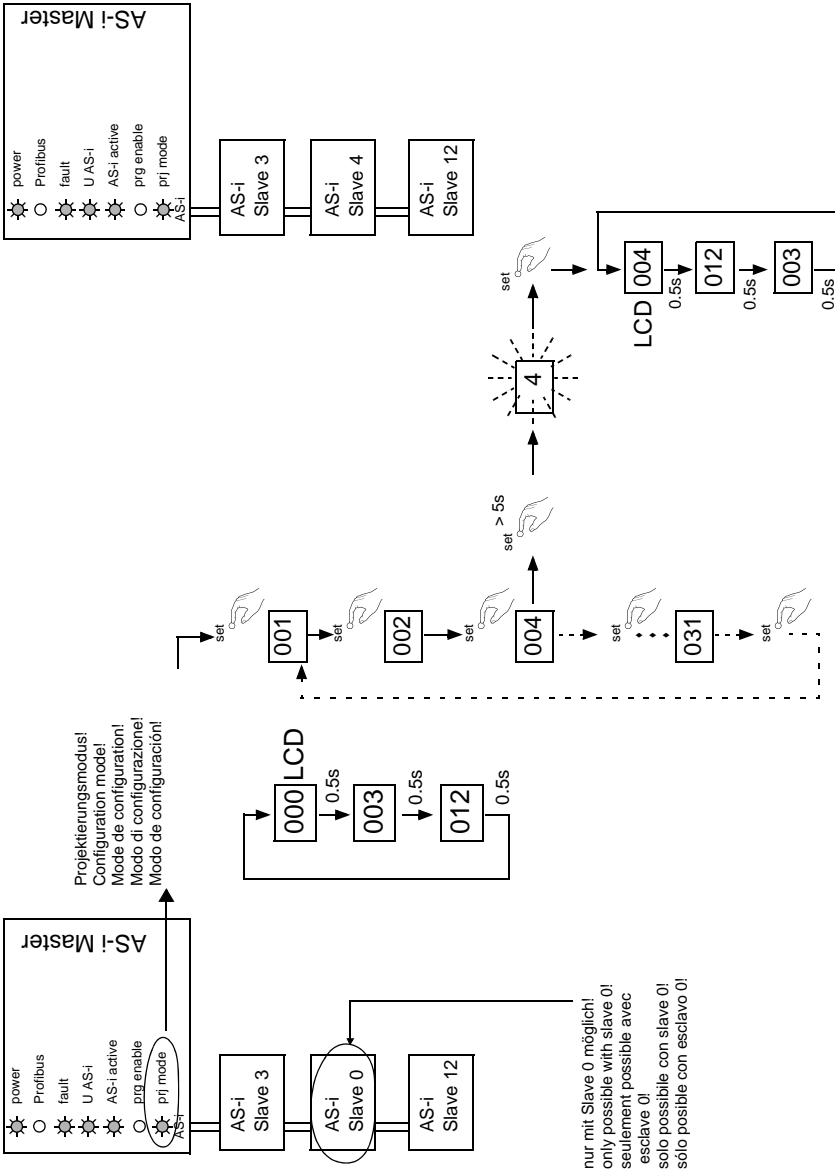


**4.6.7 Addressing**

**4.6.8 Delete slave address 5**



### 4.6.9 Programming of slave 0 to address 4



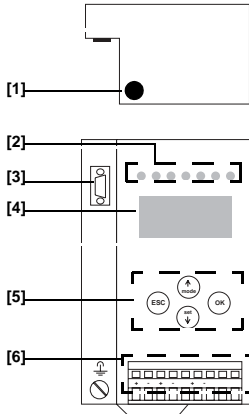
nur mit Slave 0 möglich!  
 only possible with slave 0!  
 seulement possible avec  
 esclave 0!  
 solo possibile con slave 0!  
 solo possibile con esclavo 0!

Issue date - 10.1.2008



## 5 Electrical Connection

### 5.1 Overview of connections, displays and operating keys



- [1] RS 232 diagnostic interface<sup>1</sup>  
 [2] LEDs  
 [3] Sub-D socket  
 (as PROFIBUS-interface)

- [4] LC-display  
 [5] Push-buttons  
 [6] ASI and power supply terminal

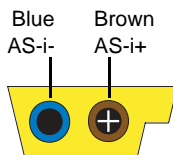
1. The servicing and diagnostic interface is used (only in connection with "AS-i Control Tools") for communication between a PC and the device. It is realized as a RS232 socket.

### 5.2 AS-i bus connection

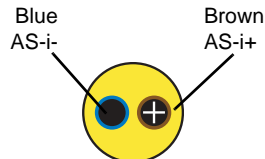


Note

*Work on electrical installations may only be carried out by qualified electricians.*



Yellow AS-i ribbon cable



Two-conductor AS-i round cable  
 (recommended: flexible power cable H05VV-F2x1.5 acc. to DIN VDE 0281)

### 5.3 Information about the device types



*You'll find a listing of all gateways and their features in <chap. 3.1 "Product information", page 12>.*

**Note**

### 5.4 Power supply and AS-i terminal assignment



**Note**

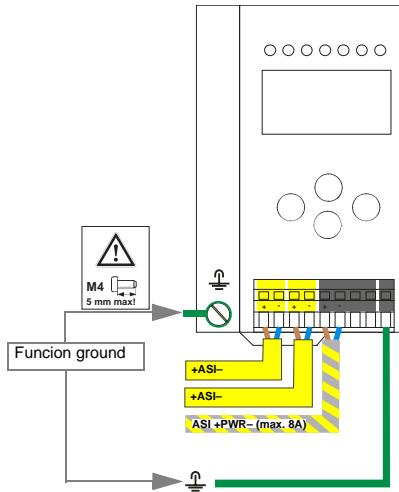
- It is not allowed to connect AS-i power supplies or another master to the yellow marked cable.
- It is not allowed to connect slaves or repeaters to the hatched marked cable.



**Note**

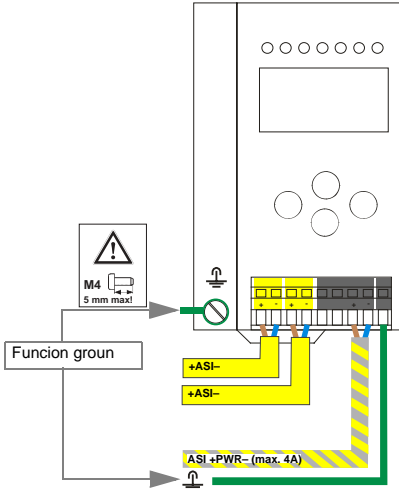
- The function ground can be connected either at the ground screw or at the terminal.
- The function ground should be connected with a cable as short as possible to guarantee a good EMC property.
- Therefore is to prefer to connect the ground via the ground screw.

### 5.4.1 Electrical connection of single master



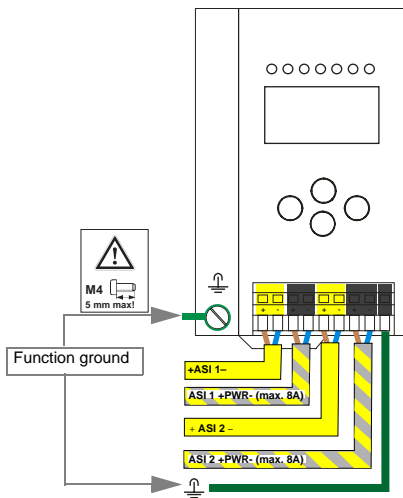
Terminal	Signal / description
+ASI -	connection to the AS-i circuit
ASI +PWR-	supply voltage AS-i circuit (max. 8 A)
FG	function ground

### 5.4.2 Electrical connection of single master with decoupling network



Terminal	Signal / description
+ASI -	connection to the AS-i circuit
ASI +PWR-	supply voltage AS-i circuit (max. 4 A)
FG	function ground

### 5.4.3 Electrical connection of double master



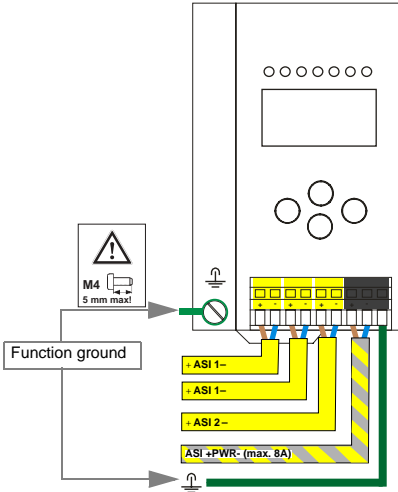
Terminal	Signal / description
+ASI 1-	connection to AS-i circuit 1
+ASI 2-	connection to AS-i circuit 2
ASI 1 +PWR-	supply voltage AS- circuit 1 (max. 8 A)
ASI 2 +PWR-	supply voltage AS- circuit 2 (max. 8 A)
FG	function ground



**Note**

*AS-i circle 1 and 2 are supplied by separate power supplies*

**5.4.4 Electrical connection of double master in version "1 power supply, 1 gateway for 2 AS-i circuits"**



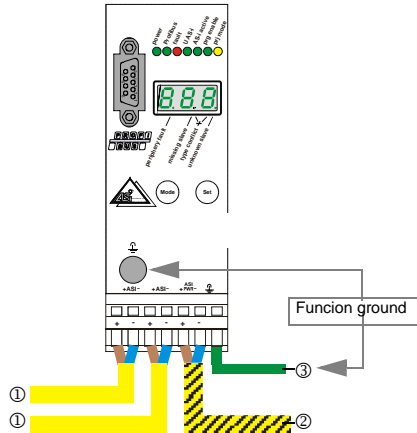
Terminal	Signal / description
+ASI 1-	connection to AS-i circuit 1
+ASI 2-	connection to AS-i circuit 2
ASI +PWR-	supply voltage AS-i circuit (max. 8 A)
FG	function ground



*AS-i circle 1 and 2 are both supplied via a Bihl+Wiedemann power supply.  
Other power supplies are not released for use!*

**Note**

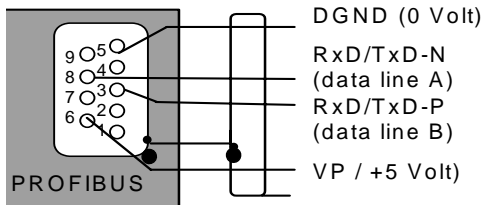
### 5.4.5 Electrical connection of Basic Master



Terminal	Signal / description
[1] +ASI -	connection to the AS-i circuit
[2] ASI +PWR-	supply voltage AS-i circuit (max. 8 A)
[3] FG	function ground

### 5.5 PROFIBUS interface

The PROFIBUS interface is realized as a 9-pin SUB-D connector, in accordance to the standard for PROFIBUS EN 50 170. It is placed at the top left-hand side of the master.



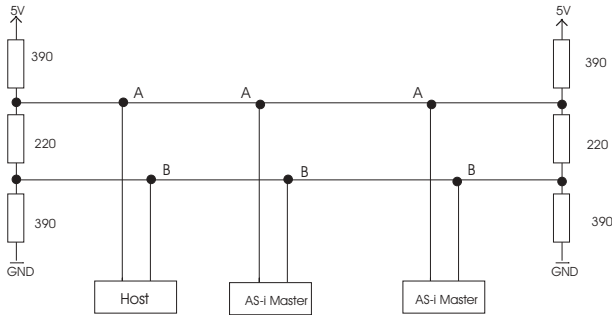
Pins	Designation of the SUB-D connector
Pin 3	Data line B („RxD/TxD-P“)
Pin 5	DGND (0 V)
Pin 6	VP / +5 V
Pin 8	Data line A („RxD/TxD-N“)

The AS-i/PROFIBUS gateway sends and receives on pins 3 and 8 of the SUB-D socket. The PROFIBUS signal "RxD/TxD-N (data line A)"<sup>1</sup> is located on pin 8, the signal "RxD/TxD-P (data line B)"<sup>1</sup> is located on pin 3.

The pins 5 (0 V) and 6 (5 V) supply 5 V DC for the bus termination.

If the PROFIBUS gateway is connected at the end of the PROFIBUS line, the termination resistors in the PROFIBUS connector have to be switched on.

### 5.5.1 Terminating resistors with PROFIBUS circuit



1. If you measure the DC voltage between RxD/TxD-P (data line B) and RxD/TxD-N (data line A), RxD/TxD-P (data line B) is the positive pole when the bus is silent.



## 5.6 Display and operating elements

### 5.6.1 LED-indicators



The LED indicators on the front side of the gateway provide important information:

<b>Power</b>	The master's power supply is sufficient
<b>PROFIBUS</b>	LED on: Gateway is allocated to a PROFIBUS Master LED off: Gateway is <i>not</i> allocated to a PROFIBUS Master
<b>config err</b>	Configuration error: At least one configured slave is missing, at least one detected slave is not projected or for at least one projected and detected slave the actual configuration data does not match the nominal configuration data. This LED flashes if there is at least one periphery fault at one AS-i slave in the AS-i network. If there are configuration errors as well as periphery faults, only configuration error is displayed.
<b>U AS-i</b>	The AS-i circuit is sufficiently powered.
<b>AS-i active</b>	Normal operation active (flashes, if a B-slave is displayed).
<b>prg enable</b>	Automatic address programming enabled. Exactly one slave is missing in protected operating mode. The slave can be replaced by another slave of the same type with address zero. The master addresses the new slave to the faulty address and thus eliminates the configuration error.
<b>prj mode</b>	The AS-i master is in configuration mode.

### 5.6.2 Push-buttons

The push-buttons cause the following:

Mode/↑↓	Switching between configuration mode and protected operating mode and saving the current AS-i configuration as the nominal configuration.
Set/↓	Selecting and assigning the address to a slave.
OK	Changing to the advanced display mode.
ESC	This button is used to leave the advanced display mode.

## 6 Operating in Advanced Display Mode



Note

The language of displayed messages can be changed with the function LANGUAGE (see chap. "Language of displayed messages").

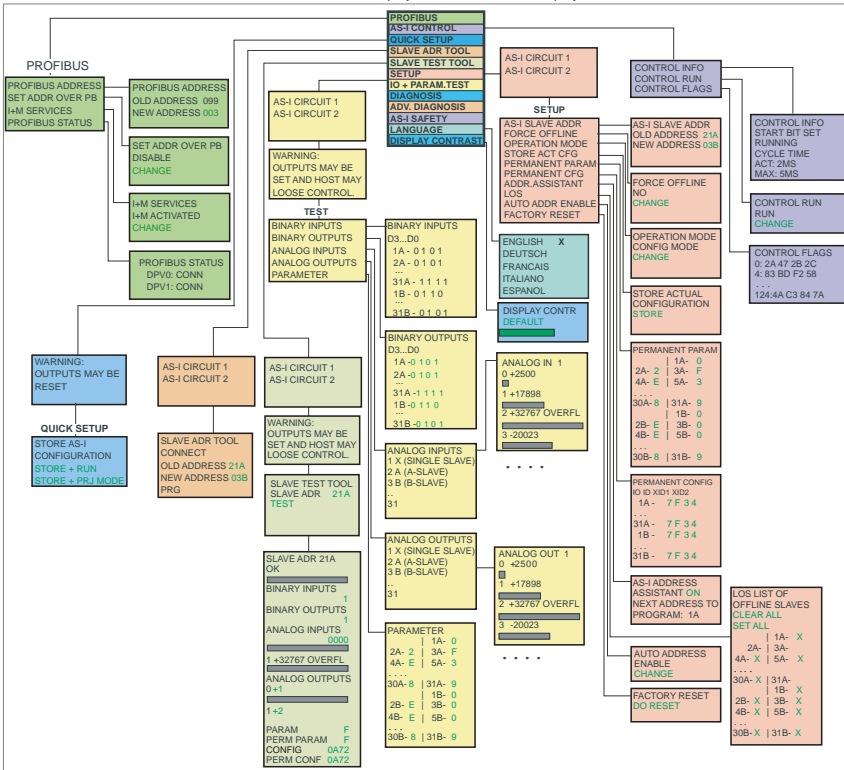
### 6.1 Overview

Klassischer Modus / Classic Mode

1.12A

grün markierte Werte sind editierbar  
green marked data can be edited

Erweiterter Display Modus / Advanced Display Mode



#### Grundsätzliche Bedienung

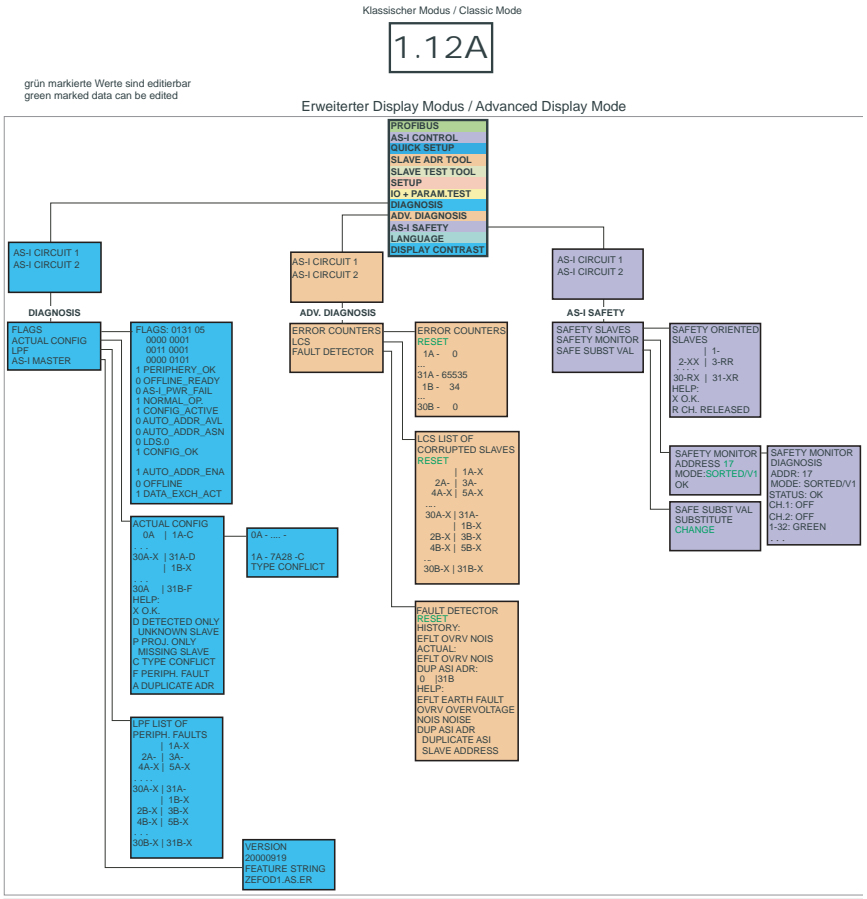
Das Gerät startet im traditionellem Modus. Mit ESC oder OK kann zwischen beiden Modi gewechselt werden. Im erweiterten Modus wird ein Cursor mit den beiden Pfeil-Tasten bewegt. OK bringt ins nächsthöhere Menü (in der Zeichnung weiter nach rechts), ESC bringt zurück ins vorherige Menü. Wenn Werte editiert werden, werden sie zunächst mit dem Cursor markiert, dann mit OK ausgewählt, mit den Pfeiltasten verändert und schließlich mit OK übernommen. ESC bricht das Editieren ab.

#### Basic Operation

The device starts in the traditional mode. You can switch between the two modes with ESC or OK. In the advanced mode the cursor is moved by both arrow buttons. Pushing OK puts you to the superior menu (in the drawing one step to the right side). ESC puts you back to the previous menu. To edit data you first mark them with the cursor and then select them with OK, change them with the arrow buttons and finally apply them with OK. Pushing ESC cancels the editing.

Issue date - 10.1.2008

AS-i 3.0 PROFIBUS-Gateway: Inbetriebnahme/Commissioning




**Grundsätzliche Bedienung**

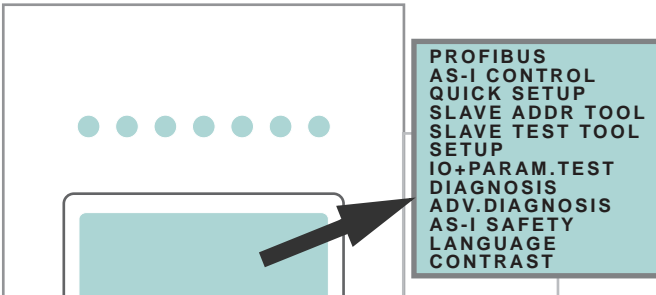
Das Gerät startet im traditionellen Modus. Mit ESC oder OK kann zwischen beiden Modi gewechselt werden. Im erweiterten Modus wird ein Cursor mit den beiden Pfeil-Tasten bewegt. OK bringt ins nächsthöhere Menü (in der Zeichnung weiter nach rechts). ESC bringt zurück ins vorherige Menü. Wenn Werte editiert werden, werden sie zunächst mit dem Cursor markiert, dann mit OK ausgewählt, mit den Pfeiltasten verändert und schließlich mit OK übernommen. ESC bricht das Editieren ab.


**Basic Operation**

The device starts in the traditional mode. You can switch between the two modes with ESC or OK. In the advanced mode the cursor is moved by both arrow buttons. Pushing OK puts you to the superior menu (in the drawing one step to the right side). ESC puts you back to the previous menu. To edit data you first mark them with the cursor and then select them with OK, change them with the arrow buttons and finally apply them with OK. Pushing ESC cancels the editing.

 <b>Warning</b>	<p>Classical (Traditional) mode does not guarantee any protection of the settings at the device!</p> <p>In the classical mode, it is possible to change settings while the device is in operation. This can lead to failure of the plant (e. g. changing the address of an AS-i slave).</p>
--	---

## 6.2 Navigating through the advanced display mode



 <b>Note</b>	<p>The settings in the advanced mode are protected, as long as the PROFIBUS Master Class 1 is running. That means that some states are indicated only. Many operations (for example: "change address", "write parameter", "set outputs", and so forth) are not possible over the display during the connection with the control (active PROFIBUS masters Class 1Bus-connection) for the protection of the plant. Before these commands can be executed at the display, first the connection (PROFIBUS Master Class 1 connection) to the control must be deactivated.</p>
--	--

The device starts in the classical mode. Press the OK button to switch to the advanced mode. To return to the classical mode, simply press the ESC button several times.

In the advanced mode, the selection can be moved up and down with the arrow buttons.

Pressing OK will switch to the selected function or menu. Pressing ESC will switch back to the previous menu.

To edit data values highlight them with the selection bar, press OK, then change them with the arrow-buttons and confirm with OK. The ESC-button cancels the editing process.

All possible addresses are displayed one after the other from 1A to 31A and from 1B to 31B. Data for single slaves are displayed at the addresses 1A - 31A.

## 6.3 PROFIBUS (main menu)

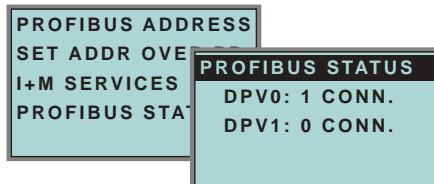
### 6.3.1 PROFIBUS Station Address



This function is used for the setting and changing of the PROFIBUS station address.

The number behind "Old Address" shows the actual station address. By selecting "New Address, this address can be changed.

### 6.3.2 PROFIBUS Status



The function *PROFIBUS Status* indicates if and how many connections are active on each PROFIBUS channel.

DPV0 = cyclic channel:

- 0: not active
- 1: active

DPV1 = acyclic channel:

- 0: not active
- ≠0: number of connections

### 6.3.3 SET ADDR OVER PB (Set address over PROFIBUS)



With the help of this function changing the address over the PROFIBUS can be switched off and on.

- CHANGE: the display changes between ENABLED and DISABLED
- DISABLED: address modification over BUS is not possible.
- ENABLED: address modification over BUS is possible.

### 6.3.4 I+M SERVICES (Information and maintenance services)



I+M SERVICES  
DISABLED  
CHANGE

The function *I+M SERVICES* enables or disables the information and maintenance services.

- CHANGE: the display changes between ENABLED and DISABLED

DISABLED: I+M service is *off*

ENABLED: I+M service is *on*.

Switching-off of *I+M SERVICES* sets additional memory in the SPC3 free. The DPV0 length limit will be modified <see chapter 8.6>.

## 6.4 QUICK SETUP

This menu enables a fast configuration of the AS-i network.



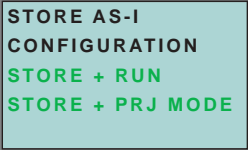
WARNING:  
OUTPUTS MAY BE  
RESET



Warning

Warning: outputs may be reset!

Pressing "OK" you switch to the submenu "Store AS-i Configuration".



STORE AS-I  
CONFIGURATION  
STORE + RUN  
STORE + PRJ MODE

"Store+Run"

With "OK" you store the current AS-i network configuration and the attached slaves as the target configuration. The gateway changes into the protected operating mode.

"Store+Prj Mode"

With "OK" you store the current AS-i network configuration and the attached slaves. The gateway remains in the *project mode*.

By pressing the "ESC" button you leave this menu and switch back to the main menu.

## 6.5 AS-i CONTROL (option)

### 6.5.1 Structure of menu AS-i CONTROL

```
CONTROL INFO
CONTROL RUN
CONTROL FLAGS
```

#### 6.5.2 AS-i Control Information

```
CONTROL INFO
START BIT SET
RUNNING
CYCLE TIME
ACT:      2 MS
MAX:      5 MS
```

This function displays the current status of the AS-i control (control program).

START BIT SET: the control program was started.

START BIT RESET: the control program was stopped.

RUNNING: the control program is running.

STOPPED: the control program was stopped.

The control program can be stopped even though the start bit was set. Example: any configuration error occurs, or the master is in the configuration mode.

CYCLE TIME ACT: current cycle time of the control program.

CYCLE TIME MAX: maximal cycle time of the control program since its last start.

#### 6.5.3 AS-i Control Run

```
CONTROL RUN
RUN
CHANGE
```

CONTROL RUN: the control program can be stopped with this function. It modifies the start bit in the menu Control Info.

RUN: the control program has been started. Even if the start bit is set, the control program can be stopped; example: any configuration error occurs, or the master is in the configuration mode.

CHANGE: the configuration program is stopped.

#### 6.5.4 AS-i Control flags (flag memory control program)

CONTROL	FLAGS
0:2A 47 2B 2C	
4:83 BD F2 58	
...	
124: 4A C3 84 7A	

The control program can read and modify the flag memory with the function "AS-i Control flags".

A procedure of modifying flag memory:

- select a line with soft keys
- press *OK* to open the selected menu

5:10111101
4:83 <b>BD</b> F2 58

- select the required flag with hot keys (the selected flag appears in the upper line binary coded)
- press *OK* to edit the selected flag in the upper line.

#### 6.6 SLAVE ADR TOOL (Slave Addressing Tool)

This function sets and changes the addresses of both new and configured AS-i slaves. This function replaces the handheld AS-i address programming device.

AS-I CIRCUIT 1
AS-I CIRCUIT 2

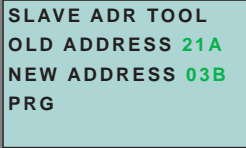
Please note that you must have selected the desired AS-i circuit using the arrow and the *OK* button when you operate a device with two AS-i circuits (see chapter 6.8.1).

SLAVE ADR TOOL
CONNECT NEW SLV
OLD ADDRESS
NEW ADDRESS



Now the new slave can be connected to the AS-i circuit. After connecting the actual address of the slave is displayed by "OLD ADDRESS".and the notice "CONNECT NEW SLV" disappears.

To give the slave a new address choose the menu entry "NEW ADDRESS". Afterwards the address can be selected with the help of the arrow buttons.The (re-) addressing is carried out by selecting the menu entry "PRG" and pressing the OK button.



```

SLAVE ADR TOOL
OLD ADDRESS 21A
NEW ADDRESS 03B
PRG
  
```

If an error occurs while addressing a slave, one of the following error messages is displayed for about 2 seconds:

Failed: SND: slave with old address has not been detected.

Failed: SD0: slave with address zero has been detected.

Failed: SD2: slave with new address has been detected.

Failed: DE: could not delete old address.

Failed: SE: error setting new address.

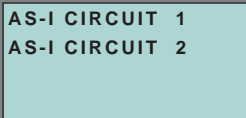
Failed: AT: new address could be stored temporarily only.

Failed: RE: error reading the extended ID-code 1.

## 6.7 SLAVE TEST TOOL

With this function a single AS-i slave can be tested.

Please note that you must have selected the desired AS-i circuit using the arrow and the OK button when you operate a device with two AS-i circuits (see chapter 6.8.1)

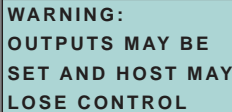


```

AS-I CIRCUIT 1
AS-I CIRCUIT 2
  
```

Now a warning message is displayed, that possibly by this test outputs are set and the host may loose control of the circuit.

To start the test press the OK button, to cancel press the button ESC.



**WARNING:  
OUTPUTS MAY BE  
SET AND HOST MAY  
LOSE CONTROL**

In the following menu the slave to be tested has to be chosen by selecting the slave address.

Afterwards the test is started by confirming the menu entry "Test".



**SLAVE TEST TOOL  
SLAVE ADR 21A  
TEST**

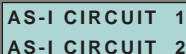
After finishing the test all relevant information is displayed for the tested slave. A successful test is displayed with "OK" below the address of the tested slave.

The following information are displayed:

- Address of the tested slave
- Existing errors are indicated
- Binary inputs (digital inputs)
- Binary outputs (digital outputs)
- Analog inputs
- Analog outputs
- Param (actual parameters)
- Perm Param (projected parameters)
- Config (actual configuration)
- Perm Conf (projected configuration)

## 6.8 SETUP (configuration of AS-i circuit)

### 6.8.1 AS-i circuit



**AS-I CIRCUIT 1  
AS-I CIRCUIT 2**

To reach this setup menu you have to change the desired AS-i circuit by using the arrow and the OK buttons.

The function is only implemented in the double master.

It makes possible to change the AS-i circuit that is currently active for being operated.

```

SLAVE 15 OK
BINARY INPUTS
  0 1
BINARY OUTPUTS
  0 1
ANALOG INPUTS
0 +17898
1 +32767 OVERFL
ANALOG OUTPUTS
0 +1789
1 +2500
PARAM          F
PERM PARAM     F
CONFIG         7FFE
PERM CONF      7FFE
  
```

The active circuit is marked by the cursor.

## 6.8.2 Structure of menu SETUP

```

AS-I SLAVE ADDR
FORCE OFFLINE
OPERATION MODE
STORE ACT CFG
PERMANENT PARAM
PERMANENT CFG
ADDR. ASSISTANT
LOS
AUTO ADDR ENABLE
FACTORY RESET
  
```

Within the menu "Setup", one of the following submenus can be chosen:

- AS-i Slave Addr (AS-i Slave Address)
- Force Offline (switch AS-i Master offline)
- Operation Mode
- Store Act Cfg (store actual detected configuration)
- Permanent Param (projected parameter)
- Permanent Cfg (projected configuration data)
- Addr. Assistant (address assistant)
- LOS (list of offline-slaves)
- Auto Adr Enable
- Factory Reset (rest for the factory adjustment)

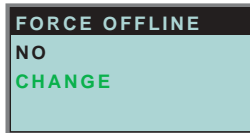
### 6.8.3 AS-I SLAVE ADR (set/change slave address)



With this function the address of a slave can be changed.

To change the address select the menu entry "OLD ADDRESS" and afterwards select the address of the slave which address should be changed. The new address of the slave has to be set in the menu entry "NEW ADDRESS". The addressing is carried out by pressing the OK button.

### 6.8.4 FORCE OFFLINE



This function shows the current state of the AS-i Master:

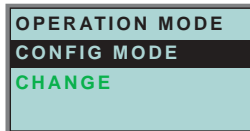
Yes: AS-i Master is offline.

No: AS-i Master is online.

With "Change", this state can be modified.

Switching the AS-i master offline puts the AS-i circuit into the safe state. The AS-i master has to be offline if an AS-i slave should be addressed via the IR-interface.

### 6.8.5 OPERATION MODE



This function shows the current operation mode of the AS-i master:

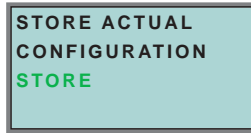
Protected Mode: Protected mode

Config Mode: Configuration mode

With "Change" the operation mode can be changed.

Only in configuration mode parameters and configuration data can be stored.

### 6.8.6 STORE ACT CFG (store actual detected configuration)



This function can only be executed in configuration mode.

This function enables you to store the configuration of all slaves which are connected and detected on the selected AS-i circuit.

If "Store" was successful, the LED "Config error" is off. The configuration is stored, the configuration error has been eliminated.

If one of the connected slaves has a peripheral fault, the LED "Config error" will flash.

If the AS-i master is in protected mode, the following error message will appear: "Failed No Config Mode"

If an AS-i slave with address zero exists, storing the configuration will be confirmed with "OK". However, the configuration error remains because address zero is not a valid operating address for storing a slave.

### 6.8.7 PERMANENT PARAM (projected parameter)

PERAMNENT PARAM		
	I	1A-0
2A-2	I	3A-F
4A-E	I	5A-3 ↓

This function allows you to set the permanent parameters. A list of all slaves is displayed from 1A - 31A and from 1B - 31B. The permanent parameters for single slaves are set from address 1A - 31A. The parameter is shown as a hexadecimal value behind the slave address.

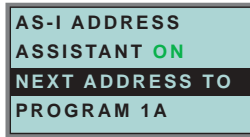
### 6.8.8 PERMANENT CONFIG (projected configuration data)

PERAMNENT CONFIG				
IO	ID	xID1	xID2	
1A	-	7 F	3	4
2A	-	7 F	3	4 ↓

With this function the projected configuration data can be projected. The values for the configuration data are displayed behind the slave address in the following order:

IO (I/O-configuration) ID (ID-configuration) xID1 (extended ID1)  
xID2 (extended ID2).

## 6.8.9 AS-I ADDRESS ASSISTENT



The AS-i address assistant helps you to set up the AS-i circuit quickly. Once you have stored the AS-i configuration, the AS-i address assistant addresses a new AS-i slave with address zero to the desired address.

Selecting "Assistant on" or "Assistant off" switches the AS-i address assistant on or off. The current state of the AS-i address assistant is displayed:

Assistant on: AS-i address assistant is switched on.

Assistant off: AS-i address assistant is switched off.

Procedure:

1. Store AS-i Configuration to the master. This can be done very comfortably with the Windows software AS-i-Control-Tools (Master | Write configuration to the AS-iAS-Interface Master ...), or directly within the advanced mode (see chapter 7).
2. All AS-i slaves have to be addressed to 0 or to the desired address. The slaves must be disconnected from the AS-i circuit.
3. Start the AS-i address assistant.
4. Now connect the AS-i slaves one after the other. The last line of the display of the AS-i address assistant shows which AS-i slave has to be connected next.

## 6.8.10 LOS (list of offline slaves)



See also "Advanced Diagnostics for AS-i Masters", chapter 7.

With "Clear all" and "Set all" you can delete or set a single bit for each AS-i slave address. Underneath there is a list of all slaves, by which the LOS bit can be set or deleted by individually selecting of the LOS bit.

Empty field: LOS bit deleted

X: LOS bit set

### 6.8.11 AUTO ADDR ENABLE (enable automatic address)



AUTO ADDRESS  
ENABLE  
CHANGE

With this function can the programming of the automatic address be released or locked.

Meaning of the displayed mode:

Enable: Automatic address programming is released.

Disable: Automatic address programming is locked.

With "Change" the operation mode can be changed.

### 6.8.12 FACTORY RESET



FACTORY RESET  
DO RESET

With this function the master can be reseted to the factory setting. The reset can be chosen by selecting the menu entry "DO RESET".



Warning

- This function should be used only in an emergency, since all attitudes transacted so far are put back to factory setting and thus perfect communication and functioning of the masters with the AS-i circle are ensured no more.
- The master and the AS-i circuit have to be recommissioned and reprojected again after a successful "Reset".
- In case of double masters the "Reset" acts on both AS-i masters!

### 6.9 IO + PARAM. TEST

#### 6.9.1 AS-i circuit



AS-I CIRCUIT 1  
AS-I CIRCUIT 2

To reach this setup menu you have to change the desired AS-i circuit by using the arrow and the OK buttons.

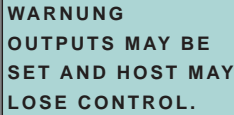
The function is only implemented in the double master.

It makes possible to change the AS-i circuit that is currently active for being operated.

The active circuit is marked by the cursor.

### 6.9.2 Structure of menu IO + PARAM. TEST

The menu IO + PARAM. TEST is used for testing of AS-i inputs/outputs as well as for reading/writing of AS-i parameters



**WARNUNG**  
**OUTPUTS MAY BE**  
**SET AND HOST MAY**  
**LOSE CONTROL.**

Before changing to the menu the following warning message will be displayed:  
 "Warning: Outputs may be set and Host may lose control."

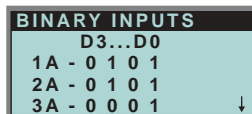


**BINARY INPUTS**  
**BINARY OUTPUTS**  
**ANALOG INPUTS**  
**ANALOG OUTPUTS**

The menu "IO + Param.Test" enables you to choose one of the following sub-menus:

- Binary Inputs
- Binary Outputs
- Analog Inputs
- Analog Outputs
- Parameter

### 6.9.3 BINARY INPUTS



**BINARY INPUTS**  
 D3...D0  
 1A - 0 1 0 1  
 2A - 0 1 0 1  
 3A - 0 0 0 1 ↓

This list shows the state of the binary inputs for all AS-i slaves.

- 0: Input deleted
- 1: Input set



## 6.9.4 BINARY OUTPUTS

BINARY OUTPUTS	
D3...D0	
1 A	0 1 0 1
2 A	0 1 0 1
3 A	0 0 0 1

This function shows the state of the binary outputs for all AS-i slaves.

0: Output deleted

1: Output set

The binary outputs can be changed after selecting the desired AS-i slave.

## 6.9.5 ANALOG INPUTS

ANALOG INPUTS	
1	X
2	A
3	B

This function shows the state of the analog inputs for all AS-i slaves.

The slave-types are characterized as follows:

**X**: single slave

**A**: A-slave

**B**: B-slave

**AB** A+B slave

...

The data of the slave B start ex channel 2!

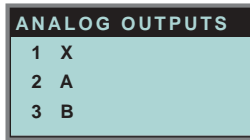
The display is as follows:

AS-i slave address, hexadecimal 16-bit value, bar display indicating the input or output value.

An eventual value overflow is displayed by "Overfl" additionally.

ANALOG IN 1	
0	+2500
1	+17898
2	+32767 OVERFL
3	-20023

## 6.9.6 ANALOG OUTPUTS

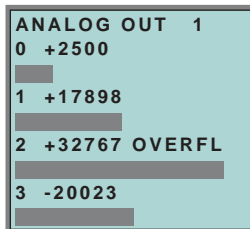


This function shows the state of the analog outputs for all AS-i slaves.

The display is as follows:

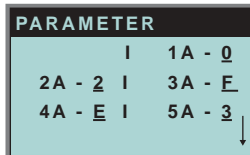
AS-i slave address, hexadecimal 16-bit value, bar display.

OVERFL displays any value overflows additionally.



The analog outputs can be changed after selecting the desired AS-i slave.

## 6.9.7 PARAMETER

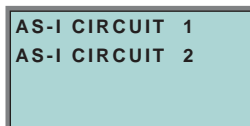


This function shows the hexadecimal value of the current AS-i parameters for all AS-i slaves.

The actual AS-i parameters can be changed after selecting the desired slave address.

## 6.10 DIAGNOSIS (normal AS-i Diagnosis)

### 6.10.1 AS-i circuit



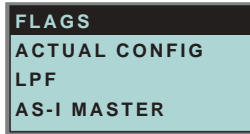
To reach this setup menu you have to change the desired AS-i circuit by using the arrow and the OK buttons.

The function is only implemented in the double master.

It makes possible to change the AS-i circuit that is currently active for being operated.

The active circuit is marked by the cursor.

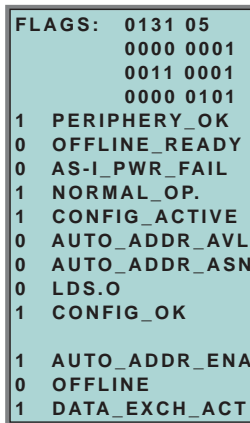
### 6.10.2 Structure of menu DIAGNOSIS



The menu "Diagnosis" enables you to choose one of the following submenus:

- Flags (EC-Flags: Execution control flags)
- Actual Config (actual configuration)
- LPF (list of periphery faults)
- AS-i Master (Info)

### 6.10.3 FLAGS



This function shows the EC-flags hexadecimally, binary and as single bits beginning with the lowest-order bit.

Arrangement of the bits within the byte:

Byte								
Bit value:	2 <sup>7</sup>	2 <sup>6</sup>	2 <sup>5</sup>	2 <sup>4</sup>	2 <sup>3</sup>	2 <sup>2</sup>	2 <sup>1</sup>	2 <sup>0</sup>
Bit.	7	6	5	4	3	2	1	0

#### Byte 1:

Bit 0: Periphery\_OK

This flag is set, if no AS-i slave signs a periphery fault.

Byte 2:

## Bit 0: Config\_OK

The flag is set, if the projected configuration corresponds with the actual configuration.

## Bit 1: LDS.0

The flag is set, if an AS-i slave with address 0 has been detected.

## Bit 2: Auto\_Addr\_Asn

The flag is set, if the automatic addressing is possible (AUTO\_ADDR\_ENABLE = 1; no "incorrect" AS-i slave is connected to AS-i).

## Bit 3: Auto\_Addr\_Avl

The flag is set, if the automatic addressing is possible. This means that exactly one slave is failed.

## Bit 4: Config\_Active

The flag is set in the configuration mode and is reset in the protected mode.

## Bit 5: Normal\_Op.

The flag is set, if the AS-i master is in normal operation.

## Bit 6: AS-i Pwr Fail

The flag is set, if the AAS-i circuit is not sufficiently powered.

## Bit 7: Offline\_Ready

The flag is set, if the AS-i master is in the offline phase.

Byte 3:

## Bit 0: Data\_Exch\_Act

If the flag "Data Exchange Active" is set, the data exchange is released with the AS-i slaves in the data exchange phase. If the bit is not set, the data exchange with AS-i slaves will be locked. Instead of data telegrams READ\_ID telegrams will be sent. The bit is set by the AS-i master by change over in the offline phase.

## Bit 1: Offline

This bit is set if the operating mode offline is to be or already taken.

## Bit 2: Auto\_Addr\_Ena

This flag indicates if the automatic addressing is locked (bit = 0) or released (bit = 1) by the user.

(For further information please refer to the manual AS-i 3.0 Command Interface)

## 6.10.4 ACTUAL CONFIG (actual configuration)

ACTUAL CONFIG		
0A	I	1A-Cf
2Ax	I	3Ad
4p	I	5A
		↓

This function shows the state of the actual configuration of the individual AS-i slaves.

At the end of the list there is a help text describing the abbreviations:

X (O.K.): The configuration data of the detected AS-i slave matches the projected configuration data.

D (Detected Only): An AS-i slave is detected at this address, but not projected.

P (Projected Only): An AS-i slave is projected at this address, but not detected.

C (Type Conflict): The configuration data of the detected AS-i slave does not match the projected configuration data. The actual detected configuration of the connected AS-i slave is displayed.

F (Periph. Fault): The AS-i slave has a peripheral fault.

A (Duplicate Adr.): 2 AS-i slaves in the indicated address

After selecting the desired AS-i slave address the values for the actual configuration data are displayed behind the respective address in the following order:

IO (I/O-configuration) ID (ID-configuration) xID1 (extended ID1)  
xID2 (extended ID2)

0A - .... -
1A - 7A28 -C
TYPE CONFLICT

Furthermore the state of the configuration is displayed in plain text.

If no AS-i slave is detected and no AS-i slave is projected at a certain address, four dots instead of the configuration data are displayed.

## 6.10.5 LPF (list of periphery faults)

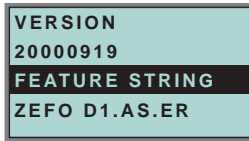
LPF LIST OF PERIPH. FAULTS		
	I	1A-x
2A-	I	3A-
		↓

The list shows AAS-i slaves, which have released a peripheral fault.

Empty field: Periphery O.K.

Empty field: X: Peripheral fault

## 6.10.6 AS-i MASTER (info)

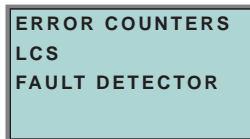


This function shows information about the version and the features of the AS-i master.

Version xxxxxxxx (date of the firmware)

Feature String xxxxxxxxxxxxxxxxx

## 6.11 ADV. DIAGNOSIS (advanced AS-i diagnosis)

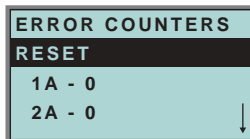


See also "Advanced Diagnostics for AS-i Masters", chapter 7.

In the menu "Adv. Diagnosis", the following submenus can be found:

- Error Counters
- LCS (list of slaves, that produced a configuration error)
- Fault Detector

### 6.11.1 ERROR COUNTERS



This list shows the error counter for each single AS-i slave.

Furthermore the number of power failures on AS-i (APF) is displayed.

By selecting "Reset", the error counters are reset to 0.

### 6.11.2 LCS (list of slaves having caused a configuration error)

RESET			
APF-	I	1A-x	↑
2A-	I	3A-	
4A-x	I	5A	↓

This list shows for each single AS-i slave whether at least one configuration error was caused by an enormous telegram transmission. This function is especially important if the configuration error only occurs short-time.

Empty field: No error

X: AS-i slave caused a configuration error.

### 6.11.3 FAULT DETECTOR

FAULT DETECTOR	
RESET	
HISTORIC:	
EFLT OVRV NOIS	
ACTUAL:	
EFLT OVRV NOIS	
DUP ASI ADR:	
0	I 31B
HELP:	
EFLT EARTH FAULT	
OVRV OVERVOLTAGE	
NOIS NOISE	
DUP ASI ADR	
DUPLICATE ASI	
SLAVE ADDRESS	

The menu "Fault Detector" shows information about the AS-i detector and allows deleting of the AS-i detector's history. Furthermore a list of abbreviations in plain language can be found in the section "Help".

By selecting "Reset" the history of the AS-i detector can be deleted.

In the section "Historic" the appeared error messages of the AS-i detector are listed since the last "Reset".

In the section "Actual" the actual appeared error messages of the AS-i detector are listed.

Following error messages are possible:

- Duplicate address (the 2 lowest slave addresses are displayed, at which a duplicate address exist).
- Earth faults
- Noise
- Overvoltage

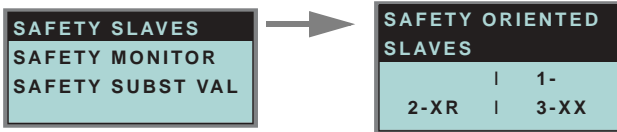
## 6.12 AS-i SAFETY



This function shows information about the safety slaves and the safety monitor:

- Safety Slaves
- Safety Monitor
- Safety Substitute Value

### 6.12.1 SAFETY ORIENTED SLAVES



This list shows the "safety-directed input slaves" ("AS-i Safety at Work"), by which the safety function is released.

X: channel o.k.

R: channel has released

The first area corresponds with the channel 2, the second one with the channel 1. XR means also: channel 2 is OK and channel 2 has released.

The channels can not be evaluate individually, if the substitution of safety slaves input data was disconnected in menu:

- command interface/ function profile

or

- slave value substitute.

Both channels must have the same state, otherwise the indication will not be proper.



## 6.12.2 SAFETY MONITOR

SAFETY MONITOR DIAGNOSIS	
ADDR:	17
MODE:	SORTED/V1
STATUS:	O.K.
CH.1:	OFF
CH.2:	OFF
1-32:	GREEN
...	

The AS-i safety monitor reads the diagnosis data of the AS-i safety monitor and shows on the display. The meaning of the shown diagnosis can be seen in the description of the safety monitor.

## 6.12.3 SAFETY SUBST VAL

SAFETY SUBST VAL SUBSTITUTE CHANGE
--

With this function the input-data-substitution by safety slaves can be turn off/on.  
SUBSTITUTE

The input-data are replaced mit following values:

Both channels released: 0000bin

Channel 1 released: 0011bin

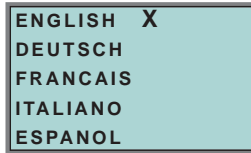
Channel 2 released: 1100bin

No channel has released: 1111bin

NO SUBSTITUTE

The safety slave input data are shown unmodified.

## 6.13 LANGUAGE (language of displayed messages)



The list of **messages** (like "missing slave" or "unknown slave") that is shown on the screen, can be edited in the desired language by using the softkey + OK buttons. The current language is marked with "x".



Note

The menu-language is English. This attitude cannot be changed! It is only possible to change the language of displayed messages (like "missing slave" or "unknown slave").

## 6.14 DISP CONTRAST (display contrast)



With this function display contrast can be adjusted.

Factory adjustment will be reloaded by selecting DEAFULT.

Approach to set the display contrast:

- select the bar line with soft keys
- verify with *OK* (the bar line flashes)
- set the display contrast with soft keys
- assume with *OK*.

If the contrast is completely misaligned, set it as follows:

- turn the master off
- press the buttons *MODE* + *SET* and hold them
- turn the master on.


## 7 Advanced Diagnostics for AS-i Masters


The advanced AS-i diagnostics serve to locate occasionally occurring errors and to judge the quality of data transmission on AS-i without additional diagnostics tools.

AS-i Control Tools (software for comfortable commissioning of AS-i and programming of AS-i Control) supports the operation of the advanced diagnostics (LCS, error counters and LOS).

### 7.1 List of corrupted AS-i Slaves (LCS)


The *LCS* contains the history of the delta list. Besides the list of projected slaves (*LPS*), the list of detected slaves (*LDS*) and the list of activated slaves (*LAS*), a fourth list, the **list of corrupted slaves (LCS)**, is created by AS-i masters with advanced diagnostics in order to locate occasionally occurring short-time configuration errors. This list contains entries of all AS-i slaves which were responsible for at least one configuration error since powering up the AS-i master or reading the list. Short-time AS-i power failures are listed in the *LCS* at the position of AS-i slave with address 0.

 <b>Note</b>	With every read-access the LCS will be deleted.
--	---

 <b>Note</b>	<p>The last short-time configuration error can also be displayed on the AS-i master:</p> <ul style="list-style-type: none"> <li>• Pressing the "Set" button of the AS-i master shows the AS-i slave which was responsible for the last short-time configuration error. If there was a short-time AS-i power failure the display shows "39" after pressing the "Set" button.</li> <li>• This function is only available if the device is in the normal operation mode of the protected mode (display empty) or in the off-line-phase.</li> </ul>
--	---

### 7.2 Protocol analysis: counters of corrupted data telegrams

The AS-i master with advanced diagnostics has a counter of telegram repetitions for each AS-i slave, which count up every time a corrupted data telegram has been found. This makes possible to judge the quality of the AS-i network, even if only a few corrupted telegrams occurred and the AS-i slave did not cause any configuration errors.

 <b>Note</b>	<ul style="list-style-type: none"> <li>• The counter values can be read via the host interface and will be deleted with every read access.</li> <li>• The counter value is limited to 254. 255 will cause a counter overflow.</li> </ul>
--	--

The protocol analysis is included in the software AS-i Control Tools by using the command master | AS-i Diagnostics.

## 7.3 Offline Phase on Configuration Errors (LOS)

The AS-i masters with advanced diagnostics offer the possibility to put themselves into the offline phase when a configuration error on the AS-Interface occurs. This way the security of the application can be ensured. The reaction to a configuration error is very fast and the host can be relieved from this task. If there are any problems on the AS-i network, the AS-interface can be switched to a secure state.

There are two different ways to parameterize the AS-i master for this feature:

- Every configuration error during normal operation in protected mode releases the off-line phase.
- For each slave address, it can be chosen whether a configuration error on this address will cause the offline phase or not. This information is stored in the list of offline slaves (LOS).

The user himself can decide how the system reacts to a configuration error on the AS-i. The AS-i master can release the off-line phase in critical situations, i. e. only with certain slave addresses, whereas in less critical situations (if one of the other AS-i slaves has a configuration error) only the error message is sent to the host, but AS-i is still running.

The parameterization "off-line phase on configuration error" is also supported by the "AS-i-Control-Tools" (command Master | Identity | Offline on configuration error).

Two ways to reset the error message "OFFLINE BY LOS" are possible:

1. Deleting of the complete list LOS of the affected AS-i circuit ("CLEAR ALL").
2. Voltage reset at the affected AS-i circuit.



By voltage reset at the AS-i circuit 1 the complete double gateway will be shut down.


## 7.4 Functions of the AS-i Fault Detector

### 7.4.1 Duplicate address' recognition

If two slaves have the same address in an AS-i circuit, a duplicate address exists. Because of this error the master can not send a request to each slave separately. At that time both responses overlap themselves on the line, it is impossible for the master to recognize the slave response safely. It exists an unstable network behaviour.

The function "**duplicate address' recognition**" allows to recognize a duplicate address and to indicate this both via the superior fieldbus and in the AS-i Control Tools.

A duplicate address causes a configuration error and will be shown in the display of the master.


 <b>Note</b>	<p>Duplicate addresses can be recognized only in the AS-i segment directly at the master. If both slaves participate in a duplicate address located behind a repeater, the <i>duplicate address' recognition</i> is impossible.</p>
--	---


#### 7.4.2 Earth Fault Detector

An *Earth Fault* exists when the voltage  $U_{\text{GND}}$  (Nominal value of  $U_{\text{GND}}=0,5 U_{\text{AS-i}}$ ) is outside of the following range:

$$10\% U_{\text{AS-i}} \leq U_{\text{GND}} \leq 90\% U_{\text{AS-i}}$$

This error limits the fail-safe characteristic of the AS-i transmission substantially. Earth faults are indicated in the master's display as well as via the superior fieldbus and the AS-i Control Tools.

 <b>Note</b>	<p>By a double master in version 1 power supply for 2 AS-i circuits an earth fault in one of the both circuits causes also an earth fault in the other circuit because of the existing galvanic connection.</p>
--	---

 <b>Note</b>	<p>For recognition of earth faults the master must be grounded with the function earth.</p>
--	---

#### 7.4.3 Noise Detector

The noise detector detects alternating voltages on AS-i, which are not produced by AS-i master or AS-i slaves. These interference voltages can cause telegram disturbances.

A frequent cause are insufficiently shielded frequency inverters or awkwardly shifted cables.

Noises are indicated in the master's display as well as via the upstream fieldbus and the AS-i Control Tools.

#### 7.4.4 Overvoltage Detector

Overvoltages are present, if the AS-i line, whose conductors lie normally electrically symmetrically to the plant earth, are strongly electrically raised. A cause can be e.g. power-on procedures of large consumers. However sometimes overvoltages don generally disturb AS-i communication, but can release incorrect signals of sensors.

Overvoltages are indicated in the master's display as well as via the upstream fieldbus and the AS-i Control Tools.

## 8 PROFIBUS DP

This chapter contains all necessary information to operate the PROFIBUS gateways in a PROFIBUS DP network.



Note

The respective bits **ground fault**, **overvoltage**, **noise**, **double address** will only be set if AS-i masters are used, which also support these functions.

### 8.1 DP Telegrams

#### 8.1.1 Diagnosis

DP Diagnosis - Single Master					
PDU byte	user byte		DP	DP V1	user
1	–	station_status 1	4		
2	–	station_status 2	4		
3	–	station_status 3	4		
4	–	master address	4		
5	–	ident high	4		
6	–	ident low	4		
7	1	header	4	4	
8	2	type		4	
9	3	slot		4	
10	4	spec		4	
11	5	ec-flags (high)			4
12	6	ec-flags (low)			4
13	7	delta (0...7)			4
14	8	delta (8...15)			4
...	...	...			...
20	14	delta (56...63)			4
21	15	LPF (0...7)			4
...	...	...			...
28	22	LPF (56 ... 63)			4

DP Diagnosis - Double Master					
PDU byte	user byte		DP	DP V1	user
1	–	station_status 1	4		
2	–	station_status 2	4		
3	–	station_status 3	4		
4	–	master address	4		
5	–	ident high	4		

Issue date - 10.1.2008

DP Diagnosis - Double Master					
PDU byte	user byte		DP	DP V1	user
6	–	ident low	4		
7	1	header	4	4	
8	2	type		4	
9	3	slot		4	
10	4	spec		4	
11	5	ec-flags (high), circuit 1			4
12	6	ec-flags (low), circuit 1			4
13	7	delta (0 ... 7), circuit 1			4
14	8	delta (8 ... 15), circuit 1			4
...	...	...			...
20	14	delta (56 ... 63), circuit 1			4
21	15	LPF (0 ... 7), circuit 1			4
...	...	...			...
28	22	LPF (56 ... 63), circuit 1			4
29	23	reserved			4
...	...	...			...
36	30	reserved			4
37	31	ec-flags (high), circuit 2			4
38	32	ec-flags (low), circuit 2			4
39	33	delta (0...7), circuit 2			4
40	34	delta (8...15), circuit 2			4
...	...	...			...
46	40	delta (56...63), circuit 2			4
47	41	LPF (0...7), circuit 2			4
...	...	...			...
54	48	LPF (56 ... 63), circuit 2			4

## ec-flags (high):

- Bit 0: periphery fault
- Bit 1 ... Bit 2 reserved
- Bit 3: failure redundant 24 V
- Bit 4: earth fault
- Bit 5: over voltage
- Bit 6: noise
- Bit 7: duplicate address

## ec-flags (low):

- Bit 0: configuration error
- Bit 1: slave with address0 detected
- Bit 2: Auto\_address\_assignment not possible
- Bit 3: Auto\_address\_assignment available
- Bit 5: not in normal operation

- Bit 4: configuration mode active
- Bit 6: AS-i power fail
- Bit 7: AS-i master is offline

**Delta List:** List of AS-i slaves with configuration error.

- 1: ConfigError
- 0: no ConfigError

**LPF:** List of AS-i slaves with periphery fault.

- 1: periphery fault
- 0: no periphery fault

Each element of the user diagnosis (ec-flags and slave lists) can be switched off by setting the appropriate bit in the parameter telegram.

Each element which is not used will be filled up with zeroes. This way the data elements in the diagnosis telegram will keep its designated position (and clear text diagnosis still fits to the data).

Only if an element at the end of the user diagnosis is not used, the length of the diagnosis will be shortened.

ExtDiag will be set if at least one of the following conditions is fulfilled:

- ConfigError  $\equiv$  1
- APF  $\equiv$  1
- PeripheryFault  $\equiv$  1

The conditions when to set the ExtDiag bit can be chosen using the user parameters or the commands of the command interface.

The GSD file includes the following presettings:

- The diagnosis transmits ec-flags, delta list and LPF.
- ExtDiag will be set if ConfigError = 1 and APF = 1. ExtDiag will not be set if there is a periphery fault.



If a double master is being used, the User-Diagnosis-Bytes 5 to 30 represent AS-i network 1 and the User-diagnosis bytes 31 to 48 represent AS-i network 2.

### 8.1.2 Parameters

With the user parameters you can choose if and which slave list will be displayed in the diagnosis. Furthermore you can select which conditions have to be fulfilled to set the ExtDiag bit within the diagnosis telegram.

DP Parameters - Single Master						
PDU byte	user byte		DP	DP V1	user	default
1	–	Station_Status	4			
2	–	WD_Fact_1	4			
3	–	WD_Fact_2	4			
4	–	min T <sub>sdr</sub>	4			
5	–	Ident High	4			
6	–	Ident Low	4			
7	–	Group_Ident	4			
8	1	DPV Status 1		4		80 <sub>16</sub>
9	2	DPV Status 2		4		00 <sub>16</sub>
10	3	DPV Status 3		4		00 <sub>16</sub>
11	4	User Byte 1			4	0B <sub>16</sub>
12	5	User Byte 2			4	06 <sub>16</sub>
13	6	User Byte 3			4	00 <sub>16</sub>

DP Parameters - Double Master						
PDU byte	user byte		DP	DP V1	user	default
1	–	Station_Status	4			
2	–	WD_Fact_1	4			
3	–	WD_Fact_2	4			
4	–	min T <sub>sdr</sub>	4			
5	–	Ident High	4			
6	–	Ident Low	4			
7	–	Group_Ident	4			
8	1	DPV Status 1		4		80 <sub>16</sub>
9	2	DPV Status 2		4		00 <sub>16</sub>
10	3	DPV Status 3		4		00 <sub>16</sub>
11	4	User Byte 1, circuit 1			4	0B <sub>16</sub>
12	5	User Byte 2, circuit 1			4	06 <sub>16</sub>
13	6	User Byte 3, circuit 1			4	00 <sub>16</sub>
14	7	User Byte 1, circuit 2			4	0B <sub>16</sub>
15	8	User Byte 2, circuit 2			4	06 <sub>16</sub>
16	9	User Byte 3, circuit 2			4	00 <sub>16</sub>

The bits in "User Byte 1" and "User Byte 3" have the following meanings:

User Byte 1								
	2 <sup>7</sup>	2 <sup>6</sup>	2 <sup>5</sup>	2 <sup>4</sup>	2 <sup>3</sup>	2 <sup>2</sup>	2 <sup>1</sup>	2 <sup>0</sup>
	-	-			LPF	-	D	F
default	0	0		0	1	0	1	1

User Byte 2								
	2 <sup>7</sup>	2 <sup>6</sup>	2 <sup>5</sup>	2 <sup>4</sup>	2 <sup>3</sup>	2 <sup>2</sup>	2 <sup>1</sup>	2 <sup>0</sup>
	FD	0		CS	PF	APF	CF	-
default	0	0		0	0	1	1	0

User Byte 3								
	2 <sup>7</sup>	2 <sup>6</sup>	2 <sup>5</sup>	2 <sup>4</sup>	2 <sup>3</sup>	2 <sup>2</sup>	2 <sup>1</sup>	2 <sup>0</sup>
	-				0			
default	0				0			

LPF: 1: LPF will be transmitted in the diagnosis

0: LPF will not be transmitted

- D: 1: Delta list will be transmitted in the diagnosis  
0: Delta list will not be transmitted
- F: 1: EC-flags will be transmitted in the diagnosis  
0: EC-flags will not be transmitted
- FD: If this bit is set, the PROFIBUS diagnosis is refreshed only if the PROFIBUS norm dictates this ("freeze diagnosis"). In doubt the data of the PROFIBUS masters diagnosis are not up to date.
- CS: 1: ExtDiag will be set if the LCS is not empty  
0: ExtDiag will not be set if the LCS is not empty
- PF: 1: ExtDiag will be set if there is a periphery fault at the AS-i line  
0: ExtDiag will not be set.
- APF: 1: ExtDiag will be set if there is an AS-i Power Fail  
0: ExtDiag will not be set.
- CF: 1: ExtDiag will be set if there is a configuration error  
0: ExtDiag will not be set.

The GSD's default user parameter telegram is:

80 <sub>16</sub>	00 <sub>16</sub>	00 <sub>16</sub>	0B <sub>16</sub>	06 <sub>16</sub>	00 <sub>16</sub>
------------------	------------------	------------------	------------------	------------------	------------------

(DPV1 enabled, diagnosis settings according to chapter 8.1.1)

If a double master is being used, the data for AS-i circuit are transmitted in the user parameter bytes 4 to 6. For circuit 2 3 additional bytes are added.

### 8.1.3 Configuration DP V0 (cyclic data)

The configuration of the AS-i/PROFIBUS gateways is made with the GSD file. Therefore the provided GSD file has to be imported into your PROFIBUS configuration tool.

### 8.1.4 Options

The original data input and outlet data can be used with different „Special IDs“.

The advantages of special input and output IDs are, that they can include up to 64 elements (bytes or words), and that the length of input and output data can be different. Additionally, "manufacturer specific" data bytes describing the ID type are possible. These "manufacturer specific" data bytes describe the which type ID is.

The GSD file offers here several combinations (several lengths) for transmitting I/O data, command interface (management) and analog data.

Therefore the analog data can be transmitted directly in the process data channel and do not have to be requested by the slower DP V1 commands.

Maximally 8 modules can be configured.

The detailed possibilities:

Length	Description
4 bytes	digital input (slaves 0 - 7)
8 bytes	digital input (slaves 0 - 15)
12 bytes	digital input (slaves 0 - 23)
16 bytes	digital input (slaves 0 - 31)
20 bytes	digital input (slaves 0 - 7B)
24 bytes	digital input (slaves 0 - 15B)
28 bytes	digital input (slaves 0 - 23B)
32 bytes	digital input (slaves 0 - 31B)

Length	Description
4 bytes	digital output (slaves 0 - 7)
8 bytes	digital output (slaves 0 - 15)
12 bytes	digital output (slaves 0 - 23)
16 bytes	digital output (slaves 0 - 31)
20 bytes	digital output (slaves 0 - 7B)
24 bytes	digital output (slaves 0 - 15B)
28 bytes	digital output (slaves 0 - 23B)
32 bytes	digital output (slaves 0 - 31B)

Length	Description
16 bytes	digital in/out (slaves 0 - 31)
16 Bytes	digital in/out (slaves 0B - 31B)
32 bytes	digital in/out (slaves 0 - 31B)



Note

2 command interfaces can be intergrated.

Length	Description
2 bytes	management (command interface)
4 bytes	management (command interface)
8 bytes	management (command interface)
11 bytes	management (command interface)
12 bytes	management (command interface)
34 bytes	management (command interface)
36 bytes	management (command interface)

Length	Description
24 bytes	analog input (slaves 29 - 31)
56 bytes	analog input (slaves 25 - 31)
88 bytes	analog input (slaves 21 - 31)
120 bytes	analog input (slaves 17 - 31)
128 bytes	analog input (slaves 16 - 31)
16 bytes	analog input (slaves 14 - 15)

Length	Description
24 bytes	analog output (slaves 29 - 31)
56 bytes	analog output (slaves 25 - 31)
88 bytes	analog output (slaves 21 - 31)
120 bytes	analog output (slaves 17 - 31)
128 bytes	analog output (slaves 16 - 31)
16 bytes	analog output (slaves 14 - 15)

Length	Description
2 bytes ... 128 bytes	analog input data circuit 1, dynamic <sup>1</sup>
2 bytes ... 128 bytes	analog output data circuit 1, dynamic <sup>1</sup>
2 bytes ... 128 bytes	analog input data circuit 2, dynamic <sup>1</sup>
2 bytes ... 128 bytes	analog output data circuit 2, dynamic <sup>1</sup>

1. Module parameters necessarily

Length	Description
2 bytes	flags and AS-i detector circuit 1
2 bytes	flags and AS-i detector circuit 2

## 8.2 I/O Data

### 8.2.1 Process data

In V2.1 mode the AS-i I/O data are mapped in the process data as known from the Siemens and AS-i/InterBus masters. This means that the lower nibble describes the data of the AS-i slave with the higher slave address. The ec-flags or hi-flags are additionally mapped at the nibble of AS-i slave 0.

byte	2 <sup>7</sup>	2 <sup>6</sup>	2 <sup>5</sup>	2 <sup>4</sup>	2 <sup>3</sup>	2 <sup>2</sup>	2 <sup>1</sup>	2 <sup>0</sup>
0	flags				slave 1/1A			
	F3	F2	F1	F0	D3	D2	D1	D0
1	slave 2/2A				slave 3/3A			
2	slave 4/4A				slave 5/5A			
3	slave 6/6A				slave 7/7A			
4	slave 8/8A				slave 9/9A			
5	slave 10/10A				slave 11/11A			
6	slave 12/12A				slave 13/13A			
7	slave 14/14A				slave 15/15A			
8	slave 16/16A				slave 17/17A			
9	slave 18/18A				slave 19/19A			
10	slave 20/20A				slave 21/21A			
11	slave 22/22A				slave 23/23A			
12	slave 24/24A				slave 25/25A			
13	slave 26/26A				slave 27/27A			
14	slave 28/28A				slave 29/29A			

Issue date: -10.1.2008

byte	$2^7$	$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$
15	slave 30/30A				slave 31/31A			
16	reserved				slave 1B			
17	slave 2B				slave 3B			
18	slave 4B				slave 5B			
19	slave 6B				slave 7B			
20	slave 8B				slave 9B			
21	slave 10B				slave 11B			
22	slave 12B				slave 13B			
23	slave 14B				slave 15B			
24	slave 16B				slave 17B			
25	slave 18B				slave 19B			
26	slave 20B				slave 21B			
27	slave 22B				slave 23B			
28	slave 24B				slave 25B			
29	slave 26B				slave 27B			
30	slave 28B				slave 29B			
31	slave 30B				slave 31B			

Flags		
	input data	output data
F0	ConfigError	Offline
F1	APF	LOS master bit
F2	PeripheryFault	→ ConfigurationMode
F3	ConfigurationActive	→ ProtectedMode

ConfigError: 0 = ConfigOK, 1 = ConfigError

APF: 0 = AS-i Power OK, 1 = AS-i Power Fail

PeripheryFault: 0 = PeripheryOK, 1 = PeripheryFault

ConfigurationActive: 0 = ConfigurationActive, 1 = ConfigurationInactive

Offline: 0 = Online, 1 = Offline

LOS-Master-Bit 0 = Offline by ConfigError deactivated

1 = Offline by ConfigError activated

A rising edge of F2 and F3 switch the master to the desired mode.

A rising edge of the "LOS master bit" effects that all bits in the LOS are set. A falling edge effects that all bits are deleted.

## 8.2.2 EC-Flags and AS-i watchdog

In addition to ec-flags, the AS-i watchdog flags will be transferred in diagnostic data too.

Diagnostic data are assembled as follows:

ec-flags (high):

- Bit 0: periphery fault
- Bit 1 ... Bit 2 reserved
- Bit 3: failure redundant 24 V (option single master)
- Bit 4: earth fault
- Bit 5: over voltage
- Bit 6: noise
- Bit 7: duplicate address

ec-flags (low):

- Bit 0: configuration error
- Bit 1: slave with address0 detected
- Bit 2: Auto\_address\_assignment not possible
- Bit 3: Auto\_address\_assignment available
- Bit 4: configuration mode active
- Bit 5: not in normal operation

### 8.3 AS-i 16-Bit Data



Note

A-Slaves map the data on channels 1 and 2.  
B-Slaves map the data on channels 3 and 4.

In addition to the access via the command interfaces, the 16-bit data for or by the slaves with 16-bit value can be exchanged cyclically (profile 7.3., S-7.4, S-6.0, S-7.5, S-7.A.8, S-7.A.9, S-7.A.A). Competing writing access attempts on analog output data will not be blocked by each other. If analog data for a particular slave are being transmitted both cyclically and acyclically with the command interface or via DP V1 connections, the acyclically transmitted values will be overwritten by the cyclically transmitted values.

AS-i 16-bit data can be transmitted in a reserved data area. Therefore accessing analog data is as easy as accessing digital data.

AS-i 16-bit data								
byte	$2^7$	$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$
1	slave 31-n/8, channel 1, high byte							
2	slave 31-n/8, channel 1, low byte							
3	slave 31-n/8, channel 2, high byte							
4	slave 31-n/8, channel 2, low byte							
...	...							
n-3	slave 31, channel 3/slave 31B, channel 1, high byte							
n-2	slave 31, channel 3/slave 31B, channel 1, low byte							
n-1	slave 31, channel 4/slave 31B, channel 2, high byte							
n	slave 31, channel 4/slave 31B, channel 2, low byte							

Issue date - 10.1.2008



## 8.4 Command Interface

Only using the IDs of the process data field the PROFIBUS gateway can be used as M0 AS-i master. By using the command interface (see chapter 8.2) the functions of a M3 master become available.

Request								
byte	$2^7$	$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$
1	command							
2	T	circuit						
3	request parameter byte 1							
...	...							
36	request parameter byte 34							

Answer								
byte	$2^7$	$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$
1	command (mirrored)							
2	result							
3	response parameter byte 1							
...	...							
34	response parameter byte 32							

A command of the command interface will be edited if the toggle bit  $T^1$  has changed. This way the same command can be used repeatedly.

The commands of the command interface can also be activated with PROFIBUS DP V1. Even the process data exchange is possible via the command interface. This way the Windows configuration software "AS-i-Control Tools" can run the whole communication via DP V1.


## 8.5 DP V1

To exchange data between the PROFIBUS master and the AS-i/PROFIBUS gateway via PROFIBUS DP V1 only one data block is used - slot 1, index 16. Within this data block a command interface is installed like the one used in the DP telegram.

The DP V1-command interfaces are edited every time they are sent. Therefore it is possible to execute the same command several times without changing "command" or "circuit" and setting a toggle bit.

## 8.6 Restrictions

The SPC3 has only 1,5 KByte DP-RAM available. Therefore the lengths of telegrams and the numbers of DP V1-connections to class 2 masters have to be restricted.

 <b>Note</b>	<p><b>I+M service</b> contains data for identification and maintenance. This service is <i>on</i> by default. Switching the services off provides additional memory into SPC3. This changes the DPVD length-limit.</p>
--	--

Restrictions due to the SPC3		
MSC1	inputs data / outputs data	single master: 288 bytes <sup>1</sup> doppel master: 272 bytes <sup>2</sup>
	diagnosis	62 bytes
	parameter	single master: 53 bytes doppel master: 88 bytes
	configuration <sup>3</sup>	32 bytes
	SetSlaveAddress	4 bytes
MSAC1	SAPs PDU	1 72 bytes <sup>4</sup>
MSAC2	SAPs PDU	2 72 bytes <sup>5</sup>

1. The maximum length of the input and output data can vary up to 288 bytes input or output data if the **I+M** (information+maintenance) **service** is *on* only. The maximum length of the input and output data (both master) is not variable and it is limited to 144 bytes (for input and output data) if the **I+M service** is disabled.
2. The maximum length of the input and output data can vary up to 272 bytes input or output data if the **I+M** (information+maintenance) **service** is *on* only. The maximum length of the input and output data (both master) is not variable and it is limited to 144 bytes (for input and output data) if the **I+M service** is disabled.
3. Maximally 8 modules can be configured
4. The maximum length is limited to 42 bytes if the **I+M service** is set to *off*.
5. The maximum length is limited to 52 bytes if the **I+M service** is set to *off*.

## 9 Commissioning with AS-i Control Tools

The Windows based software "AS-i Control Tools" is designed to make the commissioning of the AS-i 3.0 PROFIBUS Gateway so easy as possible.

The software communicates with the AS-i/PROFIBUS Gateway using a PROFIBUS DP Master Simulator DP V1 or the serial PROFIBUS master (see chap. 9.2).

### 9.1 Windows software AS-i Control Tools



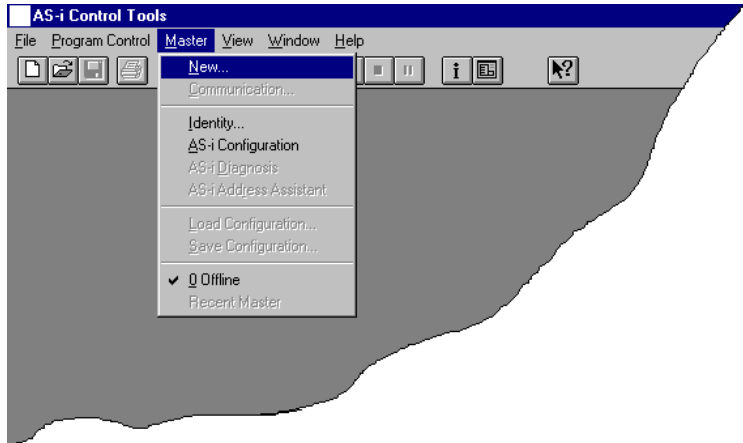
**Note**

Please install the ASi Control Tools first and the device after it!

In this way the device driver is copied into the proper folder within the ASi Control Tools and should be recognized automatically.

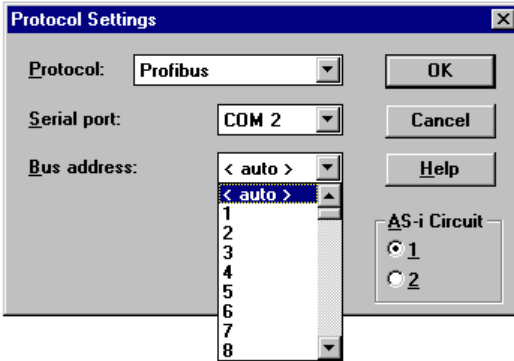
The Windows software "AS-i-Control-Tools" enables you to configure the AS-i circuit in a very comfortable way.

1. For this purpose plug in the PROFIBUS DP Master Simulator DP V1 or a serial PROFIBUS Master to the D-SUB-connector of the AS-i/PROFIBUS Gateway and connect the device over the RS 232 interface with a fully covered cable to a serial interface of your PC.
2. Start the AS-i-Control-Tools.
3. Call the command Master | New.

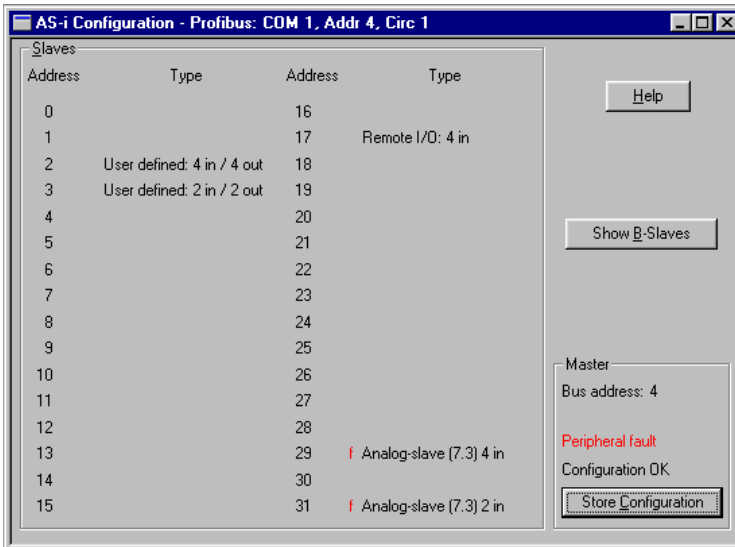


4. Choose PROFIBUS as protocol.

- Do the appropriate settings. (e.g. serial interface, COM 1, station address AS-i circuit <1>)



- Call the command Master | AS-i configuration. The AS-i configuration editor will be started. All detected and projected AS-i slaves are displayed in this window.



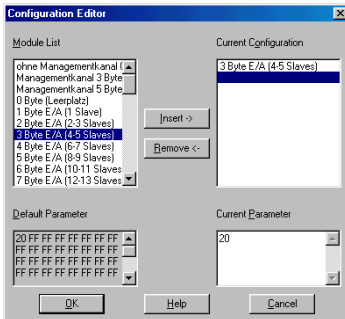


Furthermore you can use the **AS-i Address Assistant**. This tool automatically changes the address of an AS-i slave to the desired address after connecting the slave to the AS-i line. The desired AS-i configuration can be created offline before and then be stored to a file. When building up the plant you only have to connect the AS-i slaves to the AS-i line one after the other.

Further descriptions to all features of the software can be obtained from the integrated help.

## 9.2 Accessories (optional)

### 9.2.1 PROFIBUS DP Master Simulator



The PROFIBUS DP Master Simulator is an easy to use software for data exchange with PROFIBUS slaves of almost all manufacturers via PROFIBUS DP. The PROFIBUS DP master simulator can exchange data with many PROFIBUS slaves even without GSD file or type-file. The PROFIBUS slaves can be put into operation with the default I/O window. Input data can be read and output data can be written. Furthermore, the PROFIBUS DP Master Simulator also processes GSD-files. User parameters can be edited and the configuration can be modified and stored. The PROFIBUS station address can be changed with the PROFIBUS DP master simulator as well, this is useful for PROFIBUS I/O modules in protection class IP67 without addressing switches.

The PROFIBUS DP Master Simulator offers the possibility to scan a PROFIBUS network for connected slaves and to display them graphically. In this case, the case the PROFIBUS UART has to be connected directly to a PROFIBUS slave. The I/O data and the PROFIBUS user diagnosis can be displayed binary, hexadecimal and now also as ASCII code. The PROFIBUS output data can be transmitted consistently to the PROFIBUS slave. In **type mode** it is possible to set an output as long as the mouse button is pressed.

The new version of the PROFIBUS DP Master Simulator supports PROFIBUS DP V1. PROFIBUS slaves can be operated in the acyclic mode DP V1. This is especially helpful for commissioning complex field devices like drives, modular I/O systems etc.

The PROFIBUS Master Simulator consists of the software and the **PROFIBUS UART** which is the ideal interface converter between the RS 232 interface of a PC and the PROFIBUS slave. The **UART** does not need any additional external power


supply. Therefore it is also suitable for mobile use with a laptop or a notebook. The **PROFIBUS UART** is simply inserted between the PROFIBUS slave and the RS 232 connector cable.

Besides the software "PROFIBUS DP master simulator", **DLL drivers** for Windows98, Windows Me, Windows 2000 and Windows NT as well as examples written in C come with the PROFIBUS UART. This offers the possibility to **use the PROFIBUS UART in combination with an own software**. However the PROFIBUS UART is a monitoring and commissioning tool for PROFIBUS slaves, it is not designed to control automation processes.

**9.2.2 Serial PROFIBUS Master**

The serial PROFIBUS master fulfills all tasks of the PROFIBUS DP master simulator. Furthermore, it can run the PROFIBUS with up to 1,5 MBaud.

**9.2.3 Analyser**

Casing	Device	Art.-No.	Attribute
	AS-i Analyser Innovation Step 2	BW1415	Complementation of local AS-i Master diagnostic

The AS-i Analyser is a perfect complement to the local AS-i Master diagnostic of Bihl+Wiedemann gateways.

**Attribute:**


- Statistics Mode: statistical analysis of all telegrams transferred in the network: it instantly gives the "traffic lights presentation" of each slave's ability to communicate and provides a protocol of the actual state of the network
- Data Mode: topical digital and analogue I/O-values and the state of safety slaves
- Trace Mode: registers the complete telegram traffic and examines it on a notebook.

**Application area:**

- when searching for errors
- to provide a protocol which contains the network and its quality
- to diagnose a network in detail, e. g. for preventive maintenance
- to analyse your application e. g. of a Safety at Work network.

## 9.2.4 Network extension

### 9.2.4.1 AS-i Repeater IP20


Casing	Device	Art.-No.	Attribute
	AS-i Advanced Repeater	BWU1855	Extends network by more than 100 m

The AS-i Repeater with On-Board-Diagnostics have got a LED for power supply and AS-i communication errors.

#### Attribute:

- the red AS-i Fault LED flashes as long as there is no AS-i communication. The communication error LED will help the customer to find basic installation problems really fast
- the new AS-i Repeaters are compatible with all existing AS-i Repeaters
- especially the AS-i Repeaters in IP20 can be easily mounted into the switchboard in combination with an AS-i power supply
- together with the AS-i Tuner and the AS-i bus termination, the AS-i repeater from Bihl+Wiedemann is a perfect package for every AS-i network.

### 9.2.4.2 AS-i Repeater IP65

Casing	Device	Art.-No.	Attribute
	AS-i Repeater	BWU1273	Extends network an additional 100 m. Protection category IP65

The AS-i Repeater with On-Board-Diagnostics have got a LED for power supply and AS-i communication errors.


#### Attribute:

- the red AS-i *Fault LED* flashes as long as there is no AS-i communication. The communication error LED will help the customer to find basic installation problems really fast
- the new AS-i Repeaters are compatible with all existing AS-i repeaters
- together with the AS-i Tuner and the AS-i bus termination, the AS-i Repeater from Bihl+Wiedemann is a perfect package for every AS-i network.



## 9.2.5 Power supplies

### 9.2.5.1 AS-i Power Supply 4 A


Casing	Device	Art.-No.	Attribute
	AS-i power supply 4 A	BW1649	90 V AC up to 265 V AC Wide Range Power Supply

The primary clocked power supply is supposed for fieldbus applications, which transports energy and data via a 2-wire line at the same time.

#### Attribute:



- the AS-i Supply powers a fully loaded AS-i system with a maximum output current of 4.0 A.
- the sinusoidal current consumption of the power supply prevents harmonic waves
- in addition to the energy supply, the power supply takes over the function of data decoupling to the power source and the balancing of the two AS-i output lines in relation to the machine ground (screen)
- the assignment of unscreened load lines is possible.

### 9.2.5.2 24 V on 30 V AS-i Power Supply in Stainless Steel 2 A

Casing	Device	Art.-No.	Attribute
	24 V on 30 V AS-i supply in stainless steel 3 a	BW1760	24 V DC to 30 V AS-i output voltage

The AS-i Power Supply in Stainless Steel supplies the AS-i system voltage for the supply of masters, sensors, actuators and modules.

**9.2.5.3 4 A/8 A Supply for AS-i Master in Stainless Steel**


Casing	Device	Art.-No.	Attribute
	4 A supply for AS-i master in stainless steel	BW1597	4 A Class 1 Div 2 Supply 4 A for AS-i master in stainless steel for 2 AS-i circuits
	8 A supply for AS-i master in stainless steel	BW1593  BW1598	Supply 8 A for AS-i master in stainless steel for 2 AS-i circuits  Class 1 Div 2

This supply for AS-i powers one respectively two fully loaded AS-i systems with a maximum output current of 4 A respectively 8 A.

**Attribute:**

- the power supplies are continuous idle running protected and can deliver therefore a variable direct current of 0 - 4 A (BW1592/BW1597) resp. 0 - 8 A (BW1593/BW1598) as output current
- these power supplies are qualified only for the gateways in stainless steel in the version "1 power supply, 1 gateway for 2 AS-i circuits".

**9.2.5.4 8 A Power supply 3 Phases for AS-i-Master in Stainless Steel**


Casing	Device	Art.-No.	Attribute
	8 A supply 3 phases for AS-i master in stainless steel	BW1676	for 2 AS-i circuits

The power supply with 3 phases for AS-i powers one respectively two fully loaded AS-i systems with a maximum output current of 8 A.

**Attribute:**

- the power supply is continuous idle running protected and can deliver therefore a variable direct current of 0 - 8 A as output current
- these power supplies are qualified only for the gateways in stainless steel in the version "1 power supply for 2 AS-i circuits".

**9.2.5.5 AS-i Power Extender**

Casing	Device	Art.-No.	Attribute
	AS-i-Power Extender	BW1197	Extends the distance between AS-i power supply and AS-i network; 2,8 A
		BW1477	Extends the distance between AS-i power supply and AS-i network; 4,0 A

The AS-i Power Extender is used to extend the distance between the power supply and the actual AS-i network.

**Attribute:**

- data decoupling for max. 2,8 A/4,0 A current with 30 V AS-i voltage
- short circuit protection (self-recovering fuse, idle, 3 A/6 A)
- developed for the use in combination with repeater/extender
- located in an IP65 housing with a substructure module.
- in combination with gateways in IP65 you can easily build up small decentral islands.

**9.3 Further Information**

For further information please visit the homepage of Bihl+Wiedemann:  
<http://www.bihl-wiedemann.com>.

## 10 The First Commissioning of AS-i



*In this chapter an example is given, how quickly and easily an AS-i network can be put into operation without the need for external devices. The addressing of the components connected to the AS-i network can be performed directly on the AS-i master. It certainly is more comfortable to do the addressing with a handheld programming device or with the Windows software AS-i Control Tools. However, it is possible to configure even complex networks using only the AS-i master.*

What to do ?	How to go about it?
The AS-i master has to be properly supplied with power.	Using AS-i master with power supply "A": Connect the AS-i power supply unit to the terminals AS-i + and AS-i - of the master, connect the ground terminal. Using AS-i master with power supply "N": Connect the 24 V DC standard power supply with the terminals 24 V and 0 V of the master, connect the ground terminal. Turn on the power supply.
After the self-test: the LEDs "power", "config err", "U ASI" and "prj mode" are on. The LC display shows "": the AS-i master is in the offline phase. Shortly after that a "" will be displayed: the AS-i master stays in the detection phase.	
Switch the device to the projecting mode if the yellow LED does not light up.	Press the "mode" button for approx. five seconds.
The yellow LED "prj mode" lights up. The device is now in projecting mode.	
Add a slave with the address 0 to the AS-i line.	Connect the slave's terminals with the terminals AS-i +/- of the master.
The green LED "ASI active" lights up. The LC display shows "0". This indicates that the AS-i master has detected the slave.	
Change the slave address to address to "1".	Select address "1" by pressing the "set" button shortly, if necessary repeatedly; after each pressing the next free address is displayed. When a "1" appears on the display, press the "set" button for approx. five seconds until the display flashes. Press the "set" button again shortly to assign the new address to the slave.
The AS-i master detects the slave with address "1" and displays "1".	
Connect another slave with address "0" to the AS-i line and allocate the address "2" to it.	Connect the slave to the AS-i line. The addressing can be carried out the same way as the previous slave.

Issue date - 10.1.2008

What to do ?	How to go about it?
The addresses of all detected slaves are now displayed sequentially.	
Switch to the protected operating mode and store the AS-i configuration.	Leave the configuration mode by pressing the "mode" button for at least five seconds until the "prj mode" LED goes out.
The configuration of the AS-i master is now finished.	

## 11 Codes Indicated by the Display

In the basic state of the configuration mode, the display shows the addresses of all detected slaves at a rate of two per second one after the other. A blank display indicates that the *LDS* is empty, no slaves were detected.

In the basic state of the protected operating mode, the display is either blank or displays the address of a faulty assignment.

During manual address programming, the slave address display has a different meaning (see also chapter "Operating in advanced display mode").

All displayed numbers bigger than 31 which can not be interpreted as a slave address are status or error messages of the master. They have the following meanings:


39	Advanced AS-i diagnostics: After pressing the 'set'-button a short-time AS-i power failure occurred.
40	The AS-i master is in offline phase.
41	The AS-i master is in detection phase.
42	The AS-i master is in activation phase.
43	The AS-i master starts the normal operating mode.
70	Hardware error: The AS-i master's EEPROM cannot be written.
71	Wrong PIC-type.
72	Hardware error: wrong PIC-processor.
73	Hardware error: wrong PIC-processor.
74	Checksum error in the EEPROM.
75	Error in the internal RAM.
76	Error in the external RAM.
77	AS-i control software error: Stack overflow (AS-i control II)
78	AS-i control software error: Checksum error in the control program.
80	Error while attempting to exit the configuration mode: A slave with address zero exists.
81	General error while changing a slave address.
82	The front panel operation is blocked. Until repowering-up the device can only be accessed from the host via the interface.
83	Program reset of the AS-i Control program: The AS-i Control program is being read out of EEPROM and copied into the RAM.
88	Display test while starting up the AS-i master
90	Error while changing a slave address in protected operating mode: No slave with address 0 existing.
91	Error while changing slave address: Target address is already used.
92	Error while changing slave address: New address could not be set.
93	Error while changing slave address: New address could only be stored volatile in the slave.
94	Error while changing the slave address in protected operating mode: Slave has wrong configuration data.

Issue date - 10.7.2008

95	<p>The error 95 is caused by a superfluous slave and not by a missing slave. That is why the slave address is occupied by this superfluous slave.</p> <p>(In the protected mode the slave addresses which caused any configuration error can be displayed by pressing the SET button. AS-i master without graphical display are not able to differentiate between a missing slave, an incorrect slave or a redundant slave. All incorrect addresses are displayed. By pressing the SET button 5 sec. the displayed address starts to flash. Pressing the SET button again the master attempts to program the slave at the address 0 to the incorrect address.)</p>
----	--

### 11.1 Codes indicated by basic master

The basic master cannot display the following messages in a numeric form:

APF	Offline because of Power Fail
LOS	Offline because of LOS
OFH	Offline because of Host
OFL	Offline - other cause
SEA	Collet phase
	(Current light) error-free function
EFL	Ground fault

## 12 Appendix: Example for startup on a Siemens S7

This example shows you how to start up the Bihl+Wiedemann AS-i/PROFIBUS-Gateway stainless steel version (Art. No. BWU1567) on a Siemens S7-300 programmable logic controller.

Hardware used:

SIMATIC S7 power supply	PS 307 5A
SIMATIC S7-CPU with PROFIBUS DP	CPU 315-2DP
	Order No.: 6ES7 315-2AF03-0AB0
	Firmware Version 1.2
Bihl+Wiedemann AS-i/PROFIBUS-Gateway	Art. No.: BWU1567
in stainless steel	Ident No.: 11426
Bihl+Wiedemann AS-i-Power-Extender	Art. No. BW1197
	Ident No.: 10558
Bihl+Wiedemann AS-i-4E Module	
Bihl+Wiedemann AS-i-4E Module	
Power supply	Powers the AS-i components through the AS-i Power Extender

Software used:

Bihl+Wiedemann GSD-File for the AS-i/PROFIBUS-Gateway in stainless steel  
Art. No.: BWU1567

SIMATIC Step7 Version 5.2 Service Pack 1 Version: K5.2.1.0

Associated documentation:

Bihl+Wiedemann AS-i/PROFIBUS-Gateway Operating Manual  
SIEMENS S7-300 documentation

Current examples can be found in the download area on the Bihl+Wiedemann homepage.

### 12.1 Hardware configuration

#### 12.1.1 Electrical connection for AS-i

To supply the AS-i circuit, connect the output on the AS-i Power Extender or an AS-i power supply to the AS-i/Profibus-Gateway. Observe correct polarity of the terminals AS-i(+) and AS-i(-).

In the following the desired AS-i slaves are connected to the AS-i circuit.

The AS-i slaves have their device address set to 0 by default. This must be changed to the desired AS-i slave address.



You can set the AS-i slave address using the function "AS-INTERFACE SLAVE ADDR" function from the submenu "SETUP" on the AS-i/Profibus Gateway. For more detailed information, refer to chapter 6.

Once the AS-i circuit has been configured and parameterized as desired, apply this configuration to the AS-i/PROFIBUS Gateway using the function "QUICK SETUP".

The AS-i/PROFIBUS-Gateway is now ready to run.

### 12.1.2 Electrical connection for PROFIBUS-DP

To connect the AS-i/PROFIBUS-Gateway to the CPU 315-2DP, a standard PROFIBUS cable with 9-pin SUB-D plug is used.

If the AS-i/PROFIBUS Gateway is connected on the PROFIBUS as the last station, the termination resistor on the PROFIBUS plug must be enabled.

## 12.2 SIMATIC Step Configuration

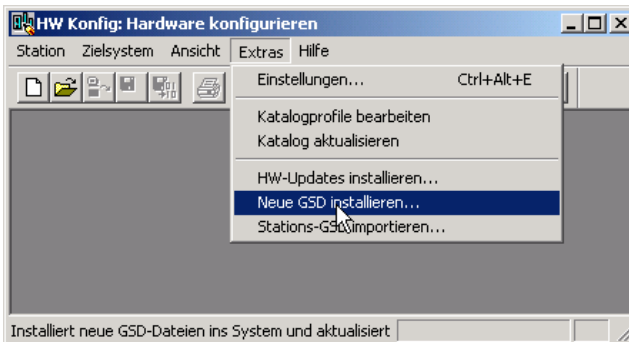
The remainder of this description presumes that a SIMATIC Step7 project has been created and added to an S7-300.

Now the hardware configuration must be opened for this SIMATIC-300 station.

### 12.2.1 Configuration of the Hardware

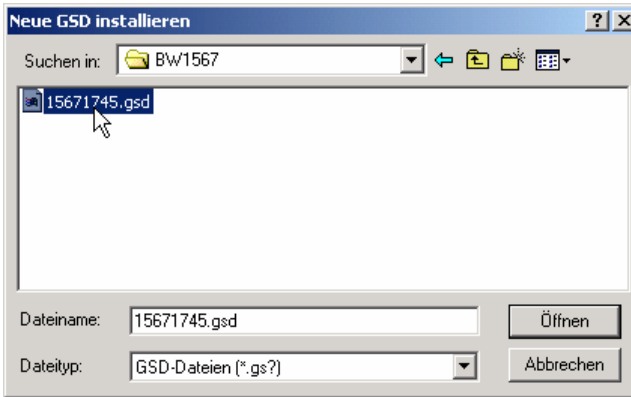
Before configuring the hardware, the GSD file 15671745.gsd supplied with the AS-i/PROFIBUS Gateway must be added to the hardware catalog.

Add the GSD file using the menu function "Install new GSD".



The PROFIBUS properties of the Bihl+Wiedemann AS-i/PROFIBUS-Gateway are described in the GSD file 15671745.gsd.

Clicking on the "Open" field adds the GSD file "15671745.gsd" to the hardware catalog.



Clicking on the "Open" field adds the GSD file "15671745.gsd" to the hardware catalog.

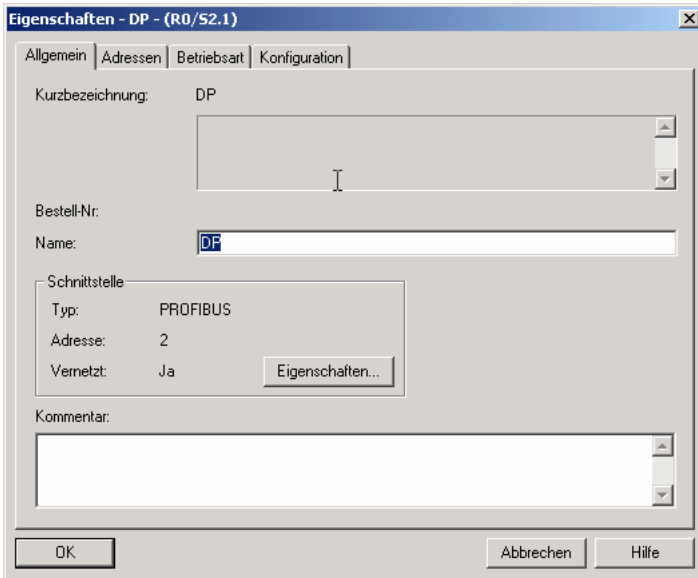
After successful installation of the GSD file you may now open the hardware catalog. The modules contained under SIMATIC 300.

1. profile rail
2. power supply e.g. PS 307 5A
3. CPU e.g. CPU 315-2 DP

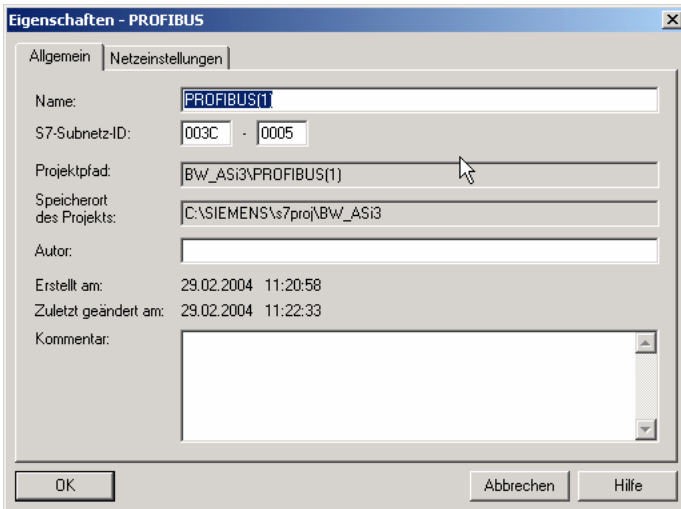
are added to the project. When selecting the CPU module, note the correct hardware version (identifiable by the imprint of the part number at lower left) and the firmware version (identifiable at left beneath the cover).

Steckplatz	Baugruppe	Bestellnummer	Firmware	MPI-Adresse	E-Adresse	A-Adresse
1	PS 307 5A	6ES7 307-1EA00-0AA0				
2	CPU 315-2 DP	6ES7 315-2AF03-0AB0	V1.2	2		
3	DP				1023*	

When adding the CPU module you are prompted for the desired PROFIBUS connection. The standard proposed is for the CPU as PROFIBUS-DP Master. This can be directly applied. The CPU mode must be set on the DP Master.



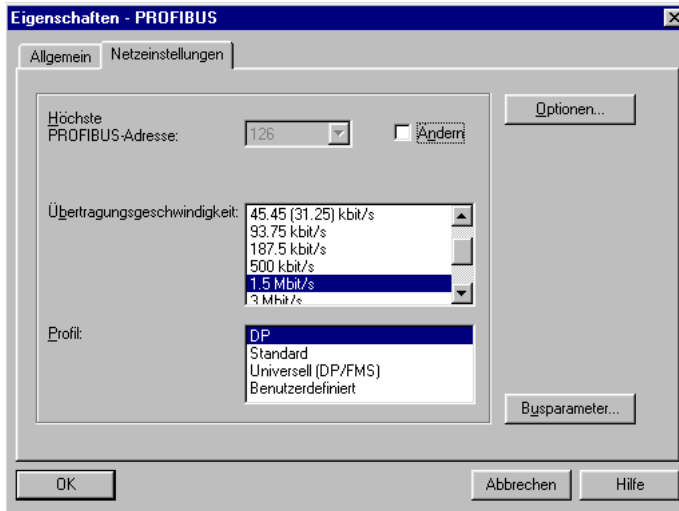
The CPU PROFIBUS-DP Properties can be used to display the properties for the PROFIBUS. Clicking on the "Settings" button displays the PROFIBUS settings.



Profile "DP" is generally used as the PROFIBUS profile.

The bit rate for the PROFIBUS can be set in the window "Properties-PROFIBUS" @ "Network settings" @ "Transmission rate".

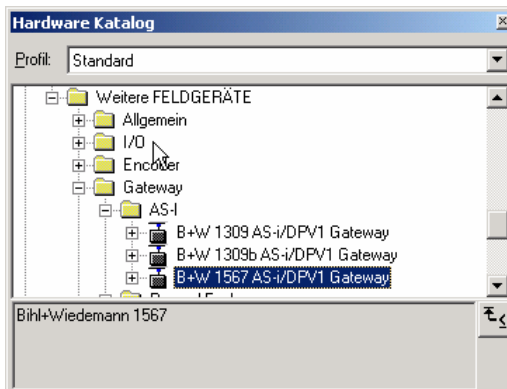
If special adjustments are needed, you can adjust the PROFIBUS parameters using the profile "Properties-PROFIBUS" @ "Network settings" @ "Profile" @ "User defined".



## 12.2.2 Insert AS-i/PROFIBUS Gateway

Once the SIMATIC hardware has been added to the hardware configuration and the PROFIBUS configured, you can add the Bihl+Wiedemann AS-i/PROFIBUS-Gateway to the project.

After successfully installing the GSD file "15671745.gsd" you will find the ASi/PROFIBUS-Gateway in the hardware catalog under PROFIBUS/Other FIELD DEVICES/Gateway/AS-i.



The AS-i/PROFIBUS-Gateway is called BWU1567 AS-i/DPV1 Gateway in the catalog and can now be added to the PROFIBUS branch using drag and drop.

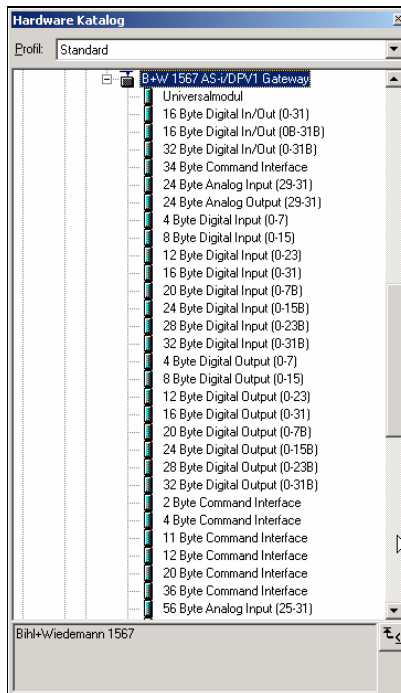
Opening the device "BWU1567 AS-i/DPV1 Gateway" by clicking on the plug sign in the hardware catalog causes a list to appear of the possible PROFIBUS communication modules.

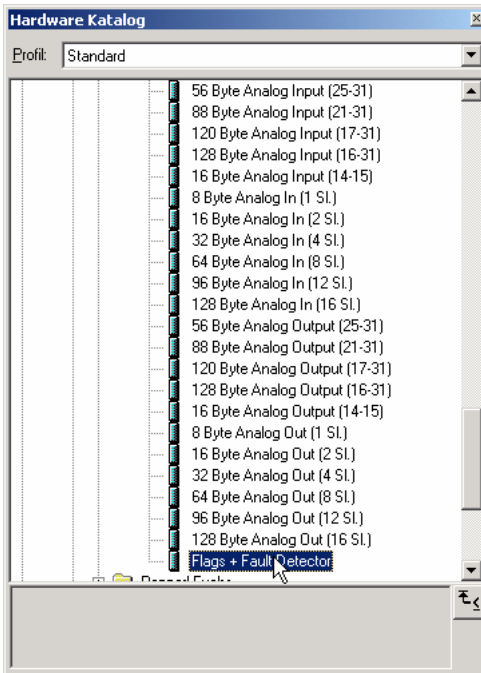
Which module you select for the desired PROFIBUS communication depends on which version of the AS-i circuit you have and on the desired communication possibilities.

For simple transmission of the data bits in an AS-i circuit with AS-i standard sensors in the I/O area of the SIMATIC CPU, use the module "16 Byte Digital In/Out (0-31)". With this module the input and output data for the possible 31 slaves in an AS-i circuit are send directly to the I/O section of the CPU.

When using A/B slaves, use the module "32 Byte Digital In/Out (0-31B)". The B-addressed slaves are mapped in the additional 15 bytes of data.

The other modules called "Digital" can be used instead of the above mentioned module to adapt to the actual AS-i circuit. This makes flexible adaptation to the structure of the AS-i circuit possible.



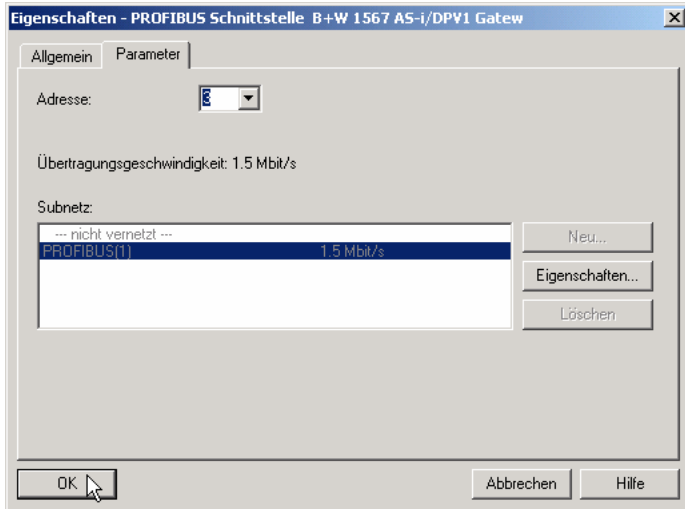


In addition to sending the AS-i slave digital data, a communication interface module can be added. The communication interface is used for sending specific commands to the AS-i/PROFIBUS-Gateway. More details about this can be found in chapter 7.

In order to send the analog values for AS-i slaves directly, the modules can be used with the keyword "Analog". The value in parentheses indicates which address range is to be used for the AS-i Analog slaves.

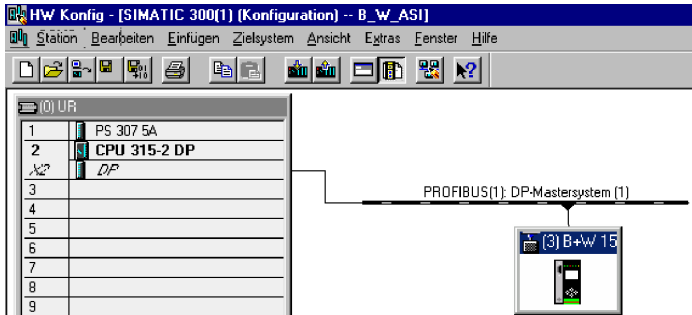
For modules "nn Byte Analog In (n Sl.)" and "nn Byte Analog Out (n Sl.)" the AS-i address of the analog slave can be freely selected.

When adding the AS-i/PROFIBUS-Gateway "1567 AS-i/DPV1Gateway" using drag and drop the dialog for assigning the PROFIBUS slave address is shown. The factory default setting for the AS-i/PROFIBUS-Gateway is Address 3.



### 12.2.3 Configuring AS-i/PROFIBUS-Gateway in-output

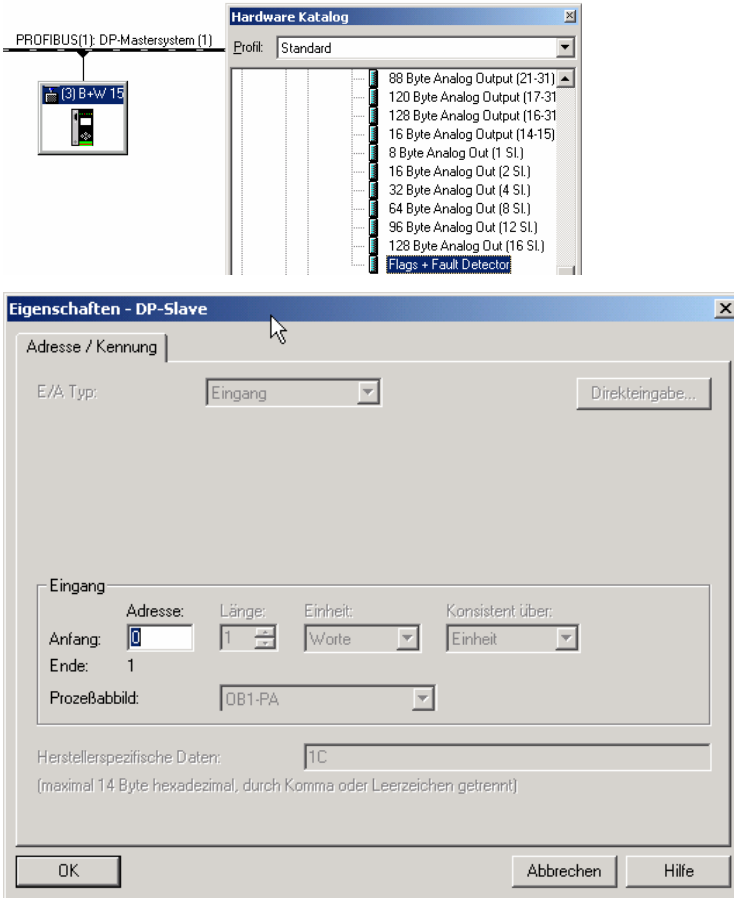
If the AS-i/PROFIBUS-Gateway is added to the PROFIBUS using drag and drop, the Step7 hardware configuration shows the following graphic.



At this point the desired PROFIBUS communication module should be parameterised. This is done in the following steps:

1. Select the AS-i/PROFIBUS-Gateway by clicking on the Slave icon. In the lower edge of the screen a table is shown which contains lines beginning with Slot 0.
2. Select the desired communication module "Flags + Fault Detector" from the hardware catalog. These flags use the individual bits to signal the operating status of the AS-i/PROFIBUS Gateway and should be processed in the application program.

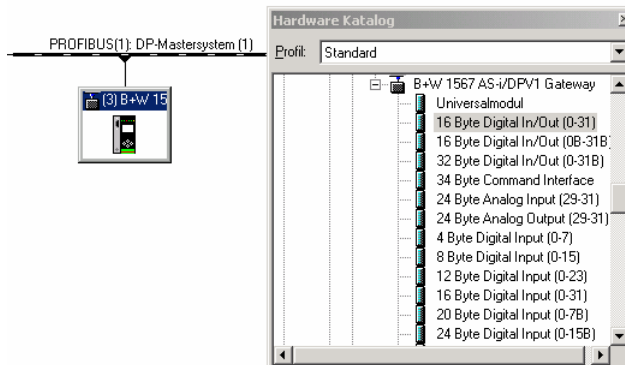
3. Drag the selected communication module to the table line for Slot 0.







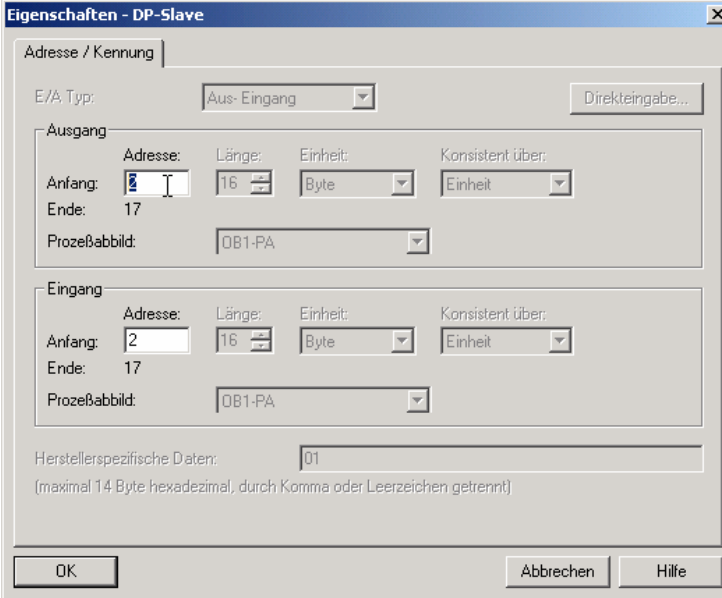
4. Select the desired communication module from the hardware catalog. Here "16 Byte Digital In/Out (0-31)"
5. Drag the selected communication module to the table line for slot 0.



6. If desired, you can now place additional modules for the command interface and analog value transmission in the following slots:

Steckplatz	DP-Kennung	Bestellnummer / Bezeichnung	E-Adresse	A-Adresse	Kommentar
0	65	Flags + Fault Detector	0...1		
1	193	16 Byte Digital In/Dut (0-31)	2...17	2...17	
2					
3					

7. Double-clicking on the desired slot line opens a dialog window in which you can assign the PROFIBUS communication module to the address range of the CPU.



**Eigenschaften - DP-Slave**

Adresse / Kennung

E/A Typ: Aus- Eingang Direkteingabe...

**Ausgang**

Adresse:	Länge:	Einheit:	Konsistent über:
Anfang: 0	16	Byte	Einheit
Ende: 17			

Prozeßabbild: 0B1-PA

**Eingang**

Adresse:	Länge:	Einheit:	Konsistent über:
Anfang: 2	16	Byte	Einheit
Ende: 17			

Prozeßabbild: 0B1-PA

Herstellerspezifische Daten: 01  
(maximal 14-Byte hexadezimal, durch Komma oder Leerzeichen getrennt)

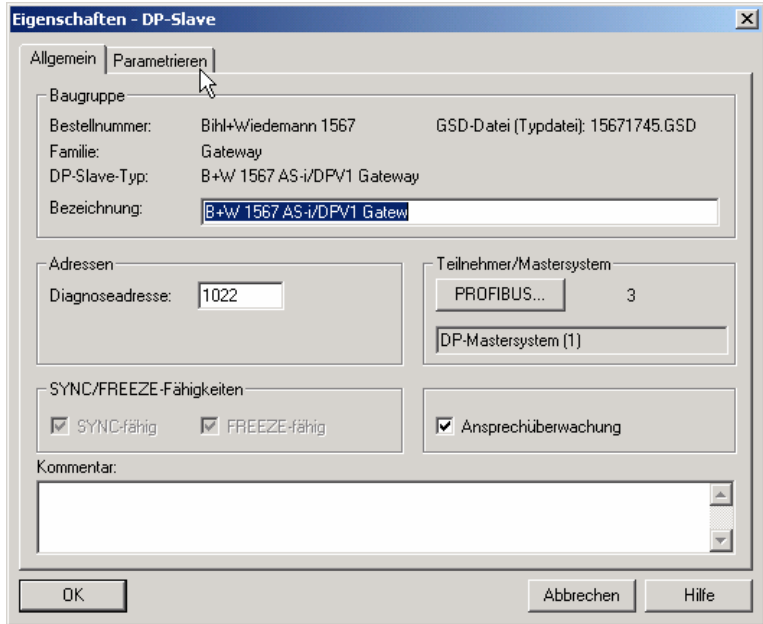
OK Abbrechen Hilfe

In this example the data transfer of the 16 byte in-/output data of the AS-i/PROFIBUS gateway takes place in (out) the CPU address range Input (output) data image byte 0 to 15.

#### 12.2.4 AS-i/PROFIBUS Gateway PROFIBUS DP parameters

The AS-i/PROFIBUS-Gateway is symbolically represented as a rectangular window connected with the PROFIBUS branch. Double-clicking in the upper line of

this window [(3) B+W 15] opens the dialog window for the properties of this PROFIBUS slave.



The diagnostics address entered in this window is used for parameterizing the function module SFC13 (diagnostic request). At this address you can use the standard function SFC13 to read out the PROFIBUS diagnostic data of this DP slave while running.

When invoking SFC13, note that the diagnostic address must be parameterized as a hexadecimal value.

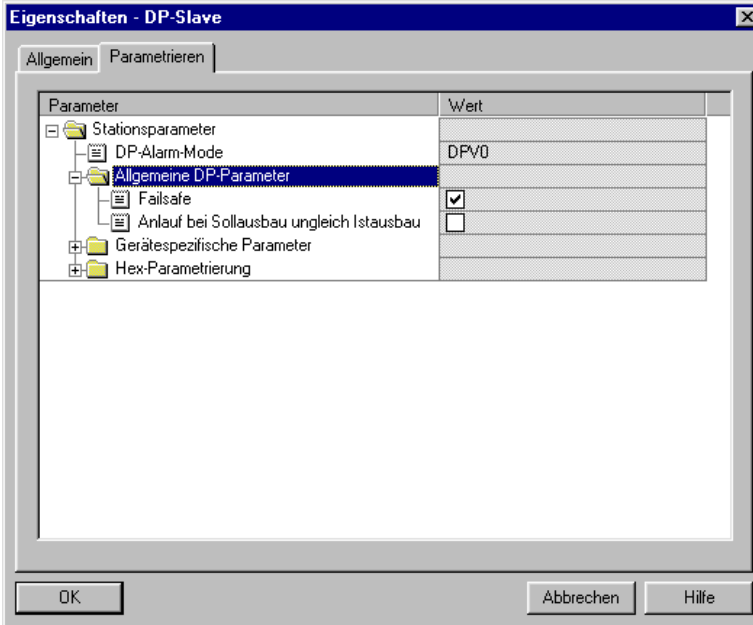
For example: Diagnostic address 1022 ® W#16#3FE

Clicking on the "Parameterize" tab displays the possible settings for the PROFIBUS start parameters.

### 12.2.4.1 General DP parameters

Startup when nominal configuration is not the same as actual configuration:

Use this parameter to specify whether the AS-i circuit should be started up even if the AS-i circuit has a different configuration than the stored AS-i configuration.



### 12.2.4.2 Device-specific parameters

#### Acyclic Communication

Turning acyclic PROFIBUS-DP communication on/off according to the DPV1 standard.

Default: Communication turned on according to DPV1.

#### AS-i Flags

Specifies whether the AS-i flags are sent in the PROFIBUS diagnostic.

Default: Transmission in the PROFIBUS diagnostic data.

#### List of Configuration Errors

The AS-i/DP Gateway saves a list of all AS-i slaves which have triggered a present configuration error. This list can be sent with the PROFIBUS diagnostic data.

Default: Transmission in the PROFIBUS diagnostic data.

## List of Peripheral Faults

The AS-i/DP Gateway saves a list of all AS-i slaves which have triggered a peripheral errors. This list can be sent with the PROFIBUS diagnostic data.

Default: Transmission in the PROFIBUS diagnostic data.

## Earth Fault

The AS-i/DP-Gateway can detect an earth (ground) fault. The information as to whether there is or is not an earth fault is sent in the diagnostic data.

Default: Transmission in the PROFIBUS diagnostic data.

## Double Address

The AS-i/DP-Gateway detects when there is double addressing. This list can be sent with the diagnostic data.

Default: Transmission in the PROFIBUS diagnostic data.

## Noise and Over voltage

The AS-i/DP-Gateway analyzes the quality of the AS-i voltage during running. This assessment can be sent with the diagnostic data.

Default: Not transmitted in the PROFIBUS diagnostic data.

## ExtDiag on Configuration Errors

When an AS-i configuration error occurs, the AS-i/DP-Gateway sets the ExtDiag flag in its PROFIBUS data reply. By setting this flag the Profibus-DP slave tells the PROFIBUS master that there is an error condition and that the diagnostic data are being updated.

In the case of the S7 controller invoking of the OB82 is triggered when an ExtDiag flag is set. If the latter is not present, the controller is stopped.

Setting this ExtDiag flag can be suppressed using this parameter. Consequently no interrupt controlled OB82 invoking is triggered in the controller, and the controller must then respond to a possible AS-i configuration error by checking the AS-i flag in the input data.

Default: Setting of the ExtDiag flag for AS-i configuration error is enabled.

## ExtDiag on AS-i Power Fail

Activates and deactivates setting of the ExtDiag flag on AS-i power fail.

Default: Setting of the ExtDiag flag on AS-i power fail is enabled.

## ExtDiag on Peripheral Faults

Activates and deactivates setting of the ExtDiag flag on peripheral faults.

Default: Setting of the ExtDiag flag on peripheral faults disabled.

**ExtDiag on Earth Fault**

Activates and deactivates setting of the ExtDiag flag on earth (ground) fault.

Default: Setting of the ExtDiag flag on earth fault is disabled.

**ExtDiag on Double Address**

Activates and deactivates setting of the ExtDiag flag on double address.

Default: Setting of the ExtDiag flag on double address is disabled.

**Freeze Diagnosis**

The diagnostic data are continuously updated during runtime. If this is not desired, this parameter can be used to disable continuous updating. Updating then takes place only when this is required by the PROFIBUS standard.

**AS-i Input Change Buffers**

Default: Disabled.

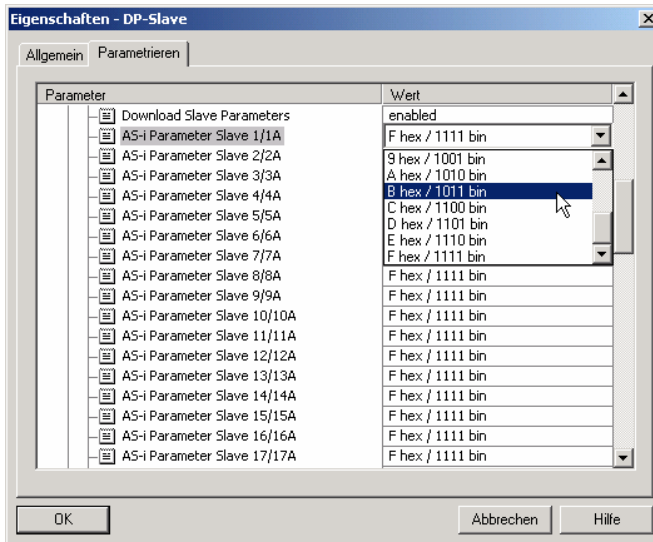
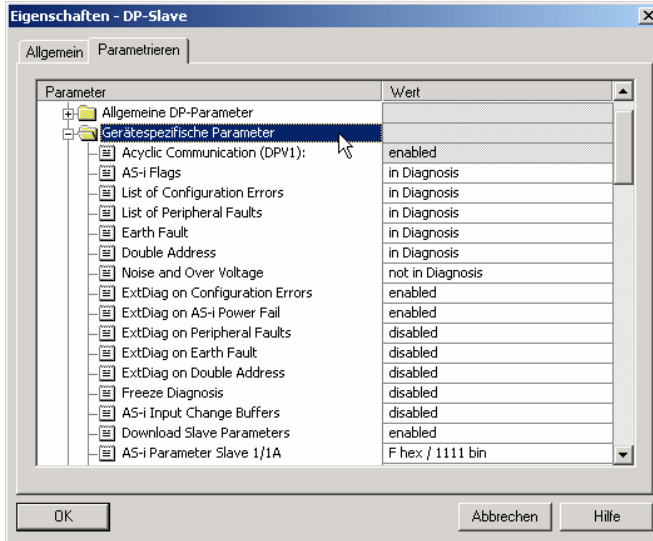
**Download Slave Parameters**

Based on this entry the parameter bits can be downloaded for each AS-i slave. These are then sent to the connected AS-i slave when the AS-i cycle is started. Sending of the set parameters bits can be disabled with this value.

Default: Sending of the AS-i parameter bits enabled.

## AS-i-Parameter Slave 1/1A...

The parameter bits send to this AS-i slave can be selected in the drop down window. The settings which are made with the parameters bits can be found in the data sheet for the corresponding slave.



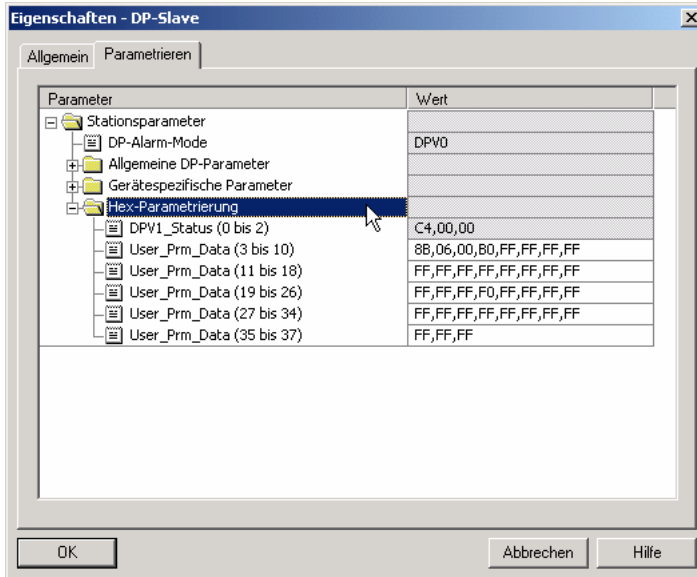
### 12.2.4.3 Hex parameterizing

#### DPV1\_Status

Hexadecimal representation of the data resulting from the settings for parameter bytes 0 to 2.

#### User\_Prm\_Data

Hexadecimal representation of the data resulting from the settings for parameter bytes 3 to 37.



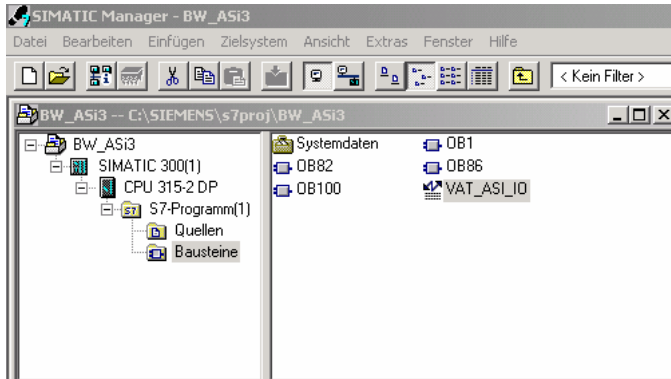
### 12.2.5 SIMATIC Step7 blocks

After the hardware has been configured, these can be sent to the CPU. Since data transmission of the AS-i data is done in this example directly to the process image, no additional Step7 program is needed for data refreshing. Therefore there is no program code in OB1.

- OB1 Cyclical program block Access to the AS-i data is via the parameterized address space in the in-/outputs process image.
- OB82 PROFIBUS diagnostic alarm. This OB is invoked as soon as a PROFIBUS slave has set the ExtDiag flag in the telegram reply. This ExtDiag flag allows a PROFIBUS slave to report an error condition to a PROFIBUS master. If OB82 is not present, the CPU is stopped when a PROFIBUS slave sets the ExtDiag flag.
- OB86 PROFIBUS peripheral error. This OB is invoked when the PROFIBUS master detects a PROFIBUS slave failure.
- OB100 Startup OB. This OB is run once when the CPU starts up.



## VAT\_ASI\_IOVariable table, AS-i startup example.



### 12.2.6 Variable table VAT\_ASI\_IO

In the hardware configuration the 16 bytes of I/O data for the AS-i/DP Gateway are coupled to the input/output byte Address 2 to 17 of the process image. The directly send AS-i diagnostic information for error processing are evident from the input bits of the EW0.

Flags + Fault Detector

Bit 0 = Konfigurationsfehler

Bit 1 = Slave with address ZERO detected

Bit 2 = Automatic addressing not possible

Bit 3 = Automatic addressing available

Bit 4 = Projecting mode active

Bit 5 = Not in normal mode

Bit 6 = AS-i-Power Fail

Bit 7 = AS-i-Master is offline

Bit 8 = Peripheral error

Bit 9 = reserved

Bit 10 = reserved

Bit 11 = reserved

Bit 12 = Earth fault

Bit 13 = Overvoltage

Bit 14 = Noise

Bit 15 = Double address

This allows the AS-i circuit data to appear directly in the process image inputs/outputs.

Operand	Symbol	Symbolkommentar	Anzahl	Statuswert
EB 2	"IN_Flags_Slave1"	Bit7-4=Flags Bit3-0=Slave1	BIN	2#0000_1000
EB 3	"IN_Slave2_Slave3"	Bit7-4=Slave2 Bit3-0=Slave3	BIN	2#0100_0000
EB 4	"IN_Slave4_Slave5"	Bit7-4=Slave4 Bit3-0=Slave5	BIN	2#0000_0000
EB 5	"IN_Slave6_Slave7"	Bit7-4=Slave6 Bit3-0=Slave7	BIN	2#0000_0000
EB 6	"IN_Slave8_Slave9"	Bit7-4=Slave8 Bit3-0=Slave9	BIN	2#0000_0000
E 2.4	"IN_ASI_Config_Error"	0=ConfigOK 1=ConfigError	BOOL	false
E 2.5	"IN_ASI_Power_Fail"	0=AS+PowerOK 1=AS+PowerError	BOOL	false
E 2.6	"IN_Periphery_Fault"	0=PeripheryOK 1=PeripherieError	BOOL	false
E 2.7	"IN_Configuration_Active"	0=ConfigActive 1=ConfigInactiv	BOOL	false
AB 2	"OUT_Flags_Slave1"	Bit7-4=Flags Bit3-0=Slave1	BIN	2#0000_0000
AB 3	"OUT_Slave2_Slave3"	Bit7-4=Slave2 Bit3-0=Slave3	BIN	2#0000_0100
AB 4	"OUT_Slave4_Slave5"	Bit7-4=Slave4 Bit3-0=Slave5	BIN	2#0000_0000
AB 5	"OUT_Slave6_Slave7"	Bit7-4=Slave6 Bit3-0=Slave7	BIN	2#0000_0000
AB 6	"OUT_Slave8_Slave9"	Bit7-4=Slave8 Bit3-0=Slave9	BIN	2#0000_0000
A 2.4	"OUT_ASI_Off_Line"	0=OnLine 1=OffLine	BOOL	false
A 2.5	"OUT_LOS_Masterbit"	0=OffLine when ConfigError 1=active when ConfigError	BOOL	false
A 2.6	"OUT_Configuration_Mode"	-> Set Configuration Mode	BOOL	false
A 2.7	"OUT_Protected_Mode"	-> Set Protected Mode	BOOL	false
EW 0	"FLags + Fault Detector"	AS-i Diagnose Information	BIN	2#0000_0000_0000_0000

In the structure of the 16-byte I/O data field each AS-i slave has a 4-bit data field. This is determined by the address of the AS-i slave within the AS-i circuit.

Assignment of the I/O address and AS-i slave address		
Address byte	Bits 7 - 4	Bits 3 - 0
I/O byte 2	flags	slave 1
I/O byte 3	slave 2	slave 3
I/O byte 4	slave 4	slave 5
I/O byte 5	slave 6	slave 7
I/O byte 6	slave 8	slave 9
I/O byte 7	slave 10	slave 11
I/O byte 8	slave 12	slave 13
I/O byte 9	slave 14	slave 15
I/O byte 10	slave 16	slave 17
I/O byte 11	slave 18	slave 19
I/O byte 12	slave 20	slave 21
I/O byte 13	slave 22	slave 23
I/O byte 14	slave 24	slave 25
I/O byte 15	slave 26	slave 27
I/O byte 16	slave 28	slave 29
I/O byte 17	slave 30	slave 31

The data for the slaves present and projected in the AS-i circuit are refreshed based on their position in the I/O data field.

The data fields for non-present slaves are filled with zero.

This means for example the AS-i data for the AS-i slave having Address 12 occupy bits 7 - 4 in I/O byte 8 of the controller.

### 12.2.6.1 AS-i flags byte 0, input bits 7 - 4

In order to check the current operating status of the AS-i circuit, the AS-i flags refreshed with each PROFIBUS cycle can be used. These for flags occupy bits 7 - 4 in input byte 0.

#### AS-i Config Error:

Bit 4: 0 = AS-i configuration OK, 1 = AS-i configuration faulty

If during running the gateway AS-i master detects a discrepancy between the nominal configuration and the actual configuration, this bit is set. This allows the control program to react to a faulty AS-i slave.

#### AS-i Power Fail

Bit 5: 0 = AS-i power OK, 1 = AS-i power fail

When there is a failure of the AS-i supply voltage, this is indicated by the AS-i power fail bit.

#### AS-i Peripheral Error

Bit 6: 0 = AS-I peripheral OK, 1 = AS-I peripheral error

This bit indicates that there is a peripheral error on an AS-i slave. This may result for example from incorrect parameterizing of the AS-i slave.

#### AS-i Configuration Active

Bit 7: 0 = AS-i configuration is active, 1 = AS-i configuration is inactive.

This bit indicates whether the AS-i gateway is in protected mode (Bit 7 = 0) or in projecting mode.

It is recommended that the AS-i flags be checked in the control program and to respond according to the reported states.



Note

It is recommended that the AS-i flags be checked in the control program and to respond according to the reported states.

### 12.2.6.2 AS-i flags byte 0, output bits 7 - 4

Output bits 7 - 4 in byte 0 can be used to affect the status of the AS-i circuit by the controller.

#### AS-i Off Line

Bit 4: 0 = Online, 1 = Offline

Use this bit to enable/disable the data cycle of the AS-i circuit. If the AS-i Master is in offline mode, no AS-i communication with the AS-i slaves will take place.

### AS-i LOS Masterbit

Bit 5: 0 = Offline when AS-i configuration error disabled, 1 = enabled

If this bit is set, the AS-i Master immediately switches to the offline phase and stops AS-i communication when an AS-i configuration error is detected. This results in the connected AS-i output modules immediately switching to safe mode (outputs turned off).

### AS-i Configuration Mode

Bit 6: 0 = no action, 1 = turn on configuration mode of AS-i Master

Setting Bit 6 switches the AS-i Master to configuration mode. Then for example the command interface can be used to save an existing AS-i configuration using the controller.

The rising edge is used for switching. After Bit 7 = 1 in the input flags has indicated that the AS-i Master is in configuration mode, output bit 6 must be reset again by the controller.

### AS-i Protected Mode

Bit 6: 0 = no action, 1 = turn on protected mode of AS-i Master

After successful configuration of the AS-i Master through the command interface, the AS-i Master can be switched back to protected mode.

The rising edge is used for switching. After Bit 7 = 0 in the input flags has indicated that the AS-i Master is in configuration mode, output bit 7 must be reset again by the controller.

The table shows an AS-i circuit which is in operation. Since there is no AS-i error, Bits 4 - 7 in the input byte are ZERO.

In the case of AS-i Slave address 1, this is a 4 I/O module. In this module Output 3 is set and Input 1 allocated.

AS-i Slave address 2 is a 4 Input module. Input 2 is set.

@VAT_ASI_IO - B_W_ASI\SIMATIC 300(1)\CPU 315-2 DP\S7-Programm(1)						
	Operand	Symbol	Anzei	Statuswert	Steuerwert	
1	EB 0	"IN_Flags_Slave1"	BIN	2#0000_0001		
2	EB 1	"IN_Slave2_Slave3"	BIN	2#0010_0000		
3	EB 2	"IN_Slave4_Slave5"	BIN	2#0000_0000		
4	EB 3	"IN_Slave6_Slave7"	BIN	2#0000_0000		
5	EB 4	"IN_Slave8_Slave9"	BIN	2#0000_0000		
6	E 0.4	"IN_ASI_Config_Error"	BOOL	false		
7	E 0.5	"IN_ASI_Power_Fail"	BOOL	false		
8	E 0.6	"IN_Periphery_Fault"	BOOL	false		
9	E 0.7	"IN_Configuration_Active"	BOOL	false		
10						
11	AB 0	"OUT_Flags_Slave1"	BIN	2#0000_0100	2#0000_0100	
12	AB 1	"OUT_Slave2_Slave3"	BIN	2#0000_0000		
13	AB 2	"OUT_Slave4_Slave5"	BIN	2#0000_0000		
14	AB 3	"OUT_Slave6_Slave7"	BIN	2#0000_0000		
15	AB 4	"OUT_Slave8_Slave9"	BIN	2#0000_0000		
16	A 0.4	"OUT_ASI_Off_Line"	BOOL	false		
17	A 0.5	"OUT_LOS_Masterbit"	BOOL	false		
18	A 0.6	"OUT_Configuration_Mode"	BOOL	false	false	
19	A 0.7	"OUT_Protected_Mode"	BOOL	false	false	
20						

### 12.2.7 System behavior on AS-i Config Error

If while running in protected mode a configured AS-i slave fails, an AS-i configuration error is generated.

1. The missing slave is shown on the display of the AS-i/DP Gateway.
2. The input flag AS-i Config Error Bit 4 in Byte 2 is set.
3. If the standard parameters for the PROFIBUS hardware configuration were applied unchanged for the AS-i/PROFIBUS Gateway, the Gateway sets the ExtDiag flag in the PROFIBUS data reply. This results in the controller signaling a PROFIBUS slave error and invoking OB82. At the same time the event is written to the diagnostic buffer of the CPU.

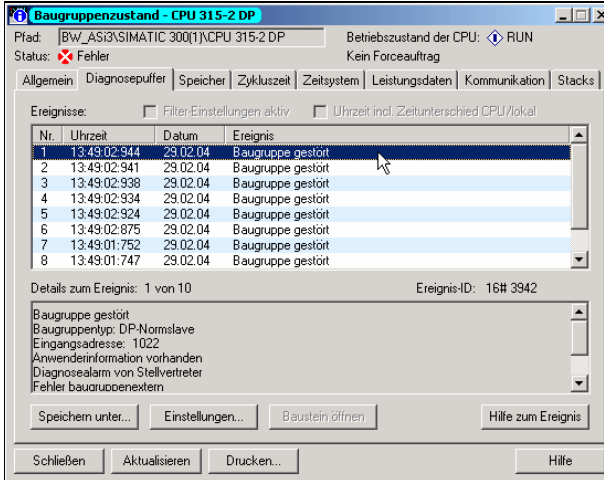
If the message for the ExtDiagFlag is turned off in the PROFIBUS parameters, no PROFIBUS message is generated and OB82 is not activated. This is always recommended for applications which do not have to respond immediately to an error using OB82. In such cases the status can be processed using the message bit of the AS-i Flags or the Flags + Fault Detector bits for the normal PLC cycle. Error management can be structured on the basis of these messages.

@VAT_ASI_IO -- B_W_ASI\SIMATIC 300(1)\CPU 315-2 DP\S7-Programm(1) ONLI					
	Operand	Symbol	Anzeigeforma	Statuswert	Steuerwert
1	EB 0	"IN_Flags_Slave1"	BIN	2#0001_0000	
2	EB 1	"IN_Slave2_Slave3"	BIN	2#0000_0000	
3	EB 2	"IN_Slave4_Slave5"	BIN	2#0000_0000	
4	EB 3	"IN_Slave6_Slave7"	BIN	2#0000_0000	
5	EB 4	"IN_Slave8_Slave9"	BIN	2#0000_0000	
6	E 0.4	"IN_ASI_Config_Error"	BOOL	true	
7	E 0.5	"IN_ASI_Power_Fail"	BOOL	false	
8	E 0.6	"IN_Periphery_Fault"	BOOL	false	
9	E 0.7	"IN_Configuration_Active"	BOOL	false	
10					
11	AB 0	"OUT_Flags_Slave1"	BIN	2#0000_0000	
12	AB 1	"OUT_Slave2_Slave3"	BIN	2#0000_0000	
13	AB 2	"OUT_Slave4_Slave5"	BIN	2#0000_0000	
14	AB 3	"OUT_Slave6_Slave7"	BIN	2#0000_0000	
15	AB 4	"OUT_Slave8_Slave9"	BIN	2#0000_0000	
16	A 0.4	"OUT_ASI_Off_Line"	BOOL	false	
17	A 0.5	"OUT_LOS_Masterbit"	BOOL	false	
18	A 0.6	"OUT_Configuration_Mode"	BOOL	false	false
19	A 0.7	"OUT_Protected_Mode"	BOOL	false	false
20					

In the diagnostic buffer of the CPU the configuration error which occurred is entered with "Module error".

The affected AS-i/DP Gateway can be ascertained from the diagnostic address of the slave which reports the error. This diagnostic address is evident as a parameter of the OB82 when it is invoked. The event is declared as an incoming event.

The diagnostic address, here 1022, refers to the specification in the hardware specification of the S7 with respect to the AS-i/DP Gateway.



**Baugruppenzustand - CPU 315-2 DP**

Pfad: B:\w\_asi\simatic 300(1)\CPU 315-2 DP Betriebszustand der CPU: RUN  
 Status: Fehler Kein Forceauftrag

Allgemein Diagnosepuffer Speicher Zykluszeit Zeitsystem Leistungsdaten Kommunikation Stacks

Ereignisse:  Filter-Einstellungen aktiv  Uhrzeit incl. Zeitunterschied CPU/lokal

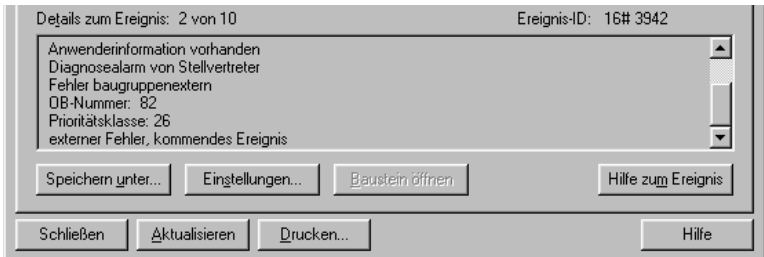
Nr.	Uhrzeit	Datum	Ereignis
1	13:43:02:944	29.02.04	Baugruppe gestört
2	13:43:02:941	29.02.04	Baugruppe gestört
3	13:43:02:938	29.02.04	Baugruppe gestört
4	13:43:02:934	29.02.04	Baugruppe gestört
5	13:43:02:924	29.02.04	Baugruppe gestört
6	13:43:02:875	29.02.04	Baugruppe gestört
7	13:43:01:752	29.02.04	Baugruppe gestört
8	13:43:01:747	29.02.04	Baugruppe gestört

Details zum Ereignis: 1 von 10 Ereignis-ID: 16# 3942

Baugruppe gestört  
 Baugruppentyp: DP-Normslave  
 Eingangsadresse: 1022  
 Anwenderinformation vorhanden  
 Diagnosealarm von Stellvertreter  
 Fehler baugruppenextern

Speichern unter... Einstellungen... Baustein öffnen Hilfe zum Ereignis

Schließen Aktualisieren Drucken... Hilfe



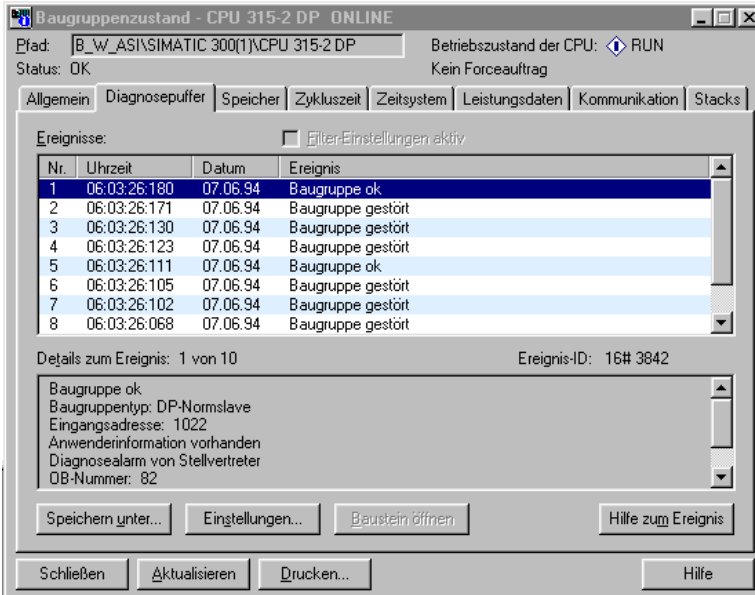
Details zum Ereignis: 2 von 10 Ereignis-ID: 16# 3942

Anwenderinformation vorhanden  
 Diagnosealarm von Stellvertreter  
 Fehler baugruppenextern  
 DB-Nummer: 82  
 Prioritätsklasse: 26  
 externer Fehler, kommendes Ereignis

Speichern unter... Einstellungen... Baustein öffnen Hilfe zum Ereignis

Schließen Aktualisieren Drucken... Hilfe

As soon as the AS-i configuration error is cleared, the OB82 is invoked again. In turn the diagnostic address of the AS-i/DP Gateway, here 1022, is entered as a parameter and the event is declared as an outgoing event.



**Baugruppenzustand - CPU 315-2 DP ONLINE**

Pfad: B\_W\_ASISIMATIC 300(1)CPU 315-2 DP Betriebszustand der CPU: RUN  
 Status: OK Kein Forceauftrag

Alleinstellen: Allgemein Diagnosepuffer Speicher Zykluszeit Zeitsystem Leistungsdaten Kommunikation Stacks

Ereignisse:  Filter-Einstellungen aktiv

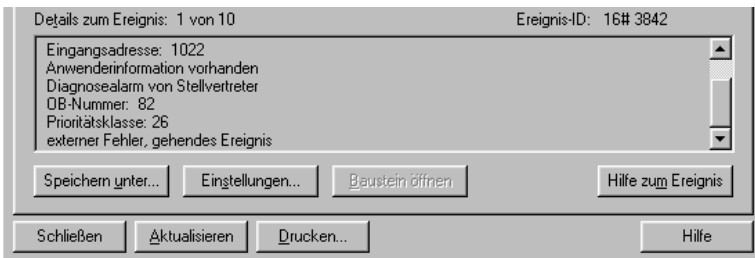
Nr.	Uhrzeit	Datum	Ereignis
1	06:03:26:180	07.06.94	Baugruppe ok
2	06:03:26:171	07.06.94	Baugruppe gestört
3	06:03:26:130	07.06.94	Baugruppe gestört
4	06:03:26:123	07.06.94	Baugruppe gestört
5	06:03:26:111	07.06.94	Baugruppe ok
6	06:03:26:105	07.06.94	Baugruppe gestört
7	06:03:26:102	07.06.94	Baugruppe gestört
8	06:03:26:068	07.06.94	Baugruppe gestört

Details zum Ereignis: 1 von 10 Ereignis-ID: 16# 3842

Baugruppe ok  
 Baugruppentyp: DP-Normslave  
 Eingangsadresse: 1022  
 Anwenderinformation vorhanden  
 Diagnosealarm von Stellvertreter  
 OB-Nummer: 82

Speichern unter... Einstellungen... Baustein öffnen Hilfe zum Ereignis

Schließen Aktualisieren Drucken... Hilfe



Details zum Ereignis: 1 von 10 Ereignis-ID: 16# 3842

Eingangsadresse: 1022  
 Anwenderinformation vorhanden  
 Diagnosealarm von Stellvertreter  
 OB-Nummer: 82  
 Prioritätsklasse: 26  
 externer Fehler, gehendes Ereignis

Speichern unter... Einstellungen... Baustein öffnen Hilfe zum Ereignis

Schließen Aktualisieren Drucken... Hilfe

Entry of the error messages in the diagnostic buffer of the CPU and invoking of the OB82 is a consequence of the set ExtDiag flag for an error in the AS-i/DP Gateway.

This can be prevented by turning off the ExtDiag flag in the PROFIBUS parameters of the AS-i Gateway.

The errors can be responded to by the controller by querying the AS-i flag in the input data. This means a configuration error is reported twice in a standard case: Once via the AS-i flag Config Error and once via the ExtDiag flag in the PROFIBUS telegram.



If for timing reasons an AS-i error must be responded to in a non-interrupt controlled way, the message can be turned off using the ExtDiag flag. In this case it is sufficient to check the AS-i flag Config Error in the program sequence.

The same applies to the other messages.

If the message for various error states of the AS-i Gateway is activated via the PROFIBUS and if the data for the PROFIBUS diagnostic data are enabled, the SIEMENS function module SFC13 can be used to retrieve the PROFIBUS diagnostic data of the AS-i Gateway and save them to a data module. Use of SFC13 is described in detail in the SIEMENS documentation for PROFIBUS.

## 13 Installation Instruction

### 13.1 Listing of all described gateways



Note

Please see **chapter 3.1, “Product information,” on page 12** for a list of all devices described in this installation instruction.

### 13.2 Single Master (BWU1567 .... see chapter 13.1)

**AS-i 3.0 PROFIBUS-Gateway in Edelstahl**  
**AS-i 3.0 PROFIBUS Gateway in Stainless Steel**  
**Passerelle AS-i 3.0 PROFIBUS DP en boîtier inox**  
**Gateway AS-i 3.0 PROFIBUS d'acciaio inox**  
**Pasarela AS-i 3.0 PROFIBUS en acero inoxidable**

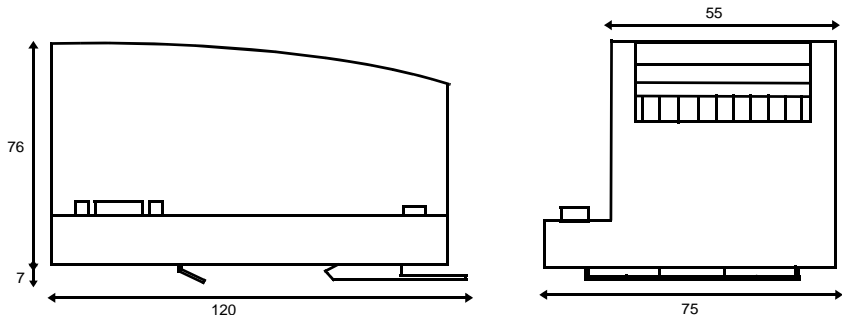


Dokumentation AS-i/PROFIBUS-Gateways (deutsch)  
 Documentation AS-i/PROFIBUS-Gateways (english)



Die Geräte dürfen nur von Fachpersonal aufgebaut, angeschlossen und in Betrieb genommen werden! / Only qualified staff is allowed to mount, connect and set up the modules! / Les modules ne doivent être montés, raccordés et mis en service que par du personnel qualifié! / Gli apparecchi possono essere montati, collegati e messi in funzione soltanto da personale specializzato! / Los aparatos sólo pueden ser montados, conectados y puestos en servicio por personal técnico especializado!

#### 13.2.1 Dimensions

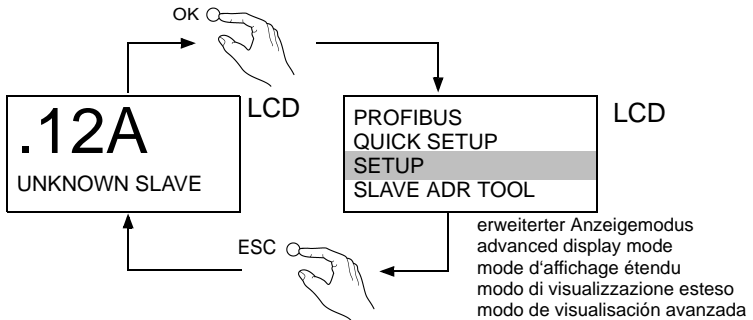


Ausgabedatum: 10.1.2008

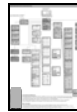


### 13.2.3 Startup

#### 13.2.3.1 Switching to advanced display mode

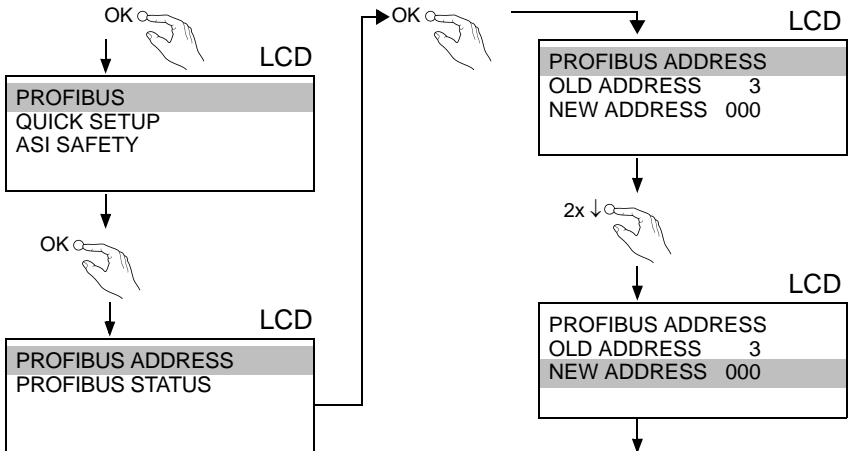


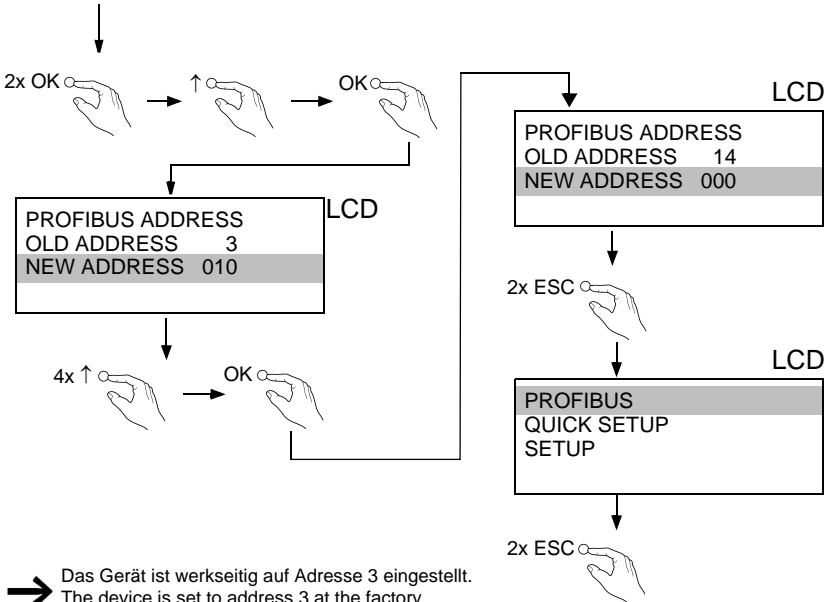
klassische Anzeige  
classical display  
affichage classique  
display classico  
indicación clásica



Aufbau siehe Zusatzblatt  
structure see additional page  
structure voir page supplémentaire  
struttura vedi pagina supplementare  
estructura ver página adicional

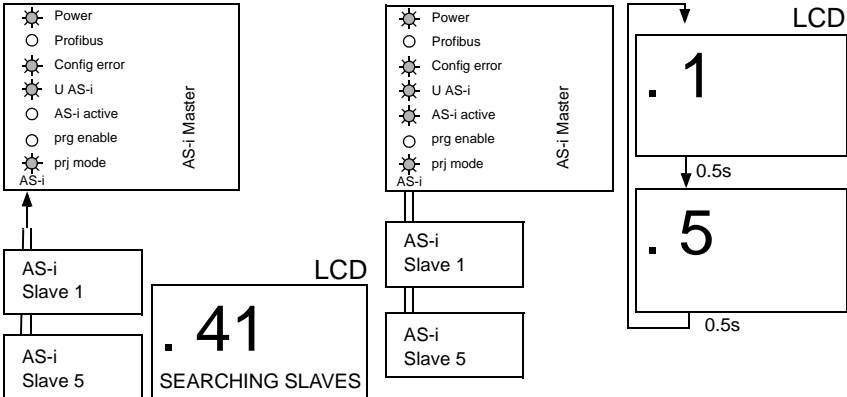
#### 13.2.4 Setting the PROFIBUS-DP address





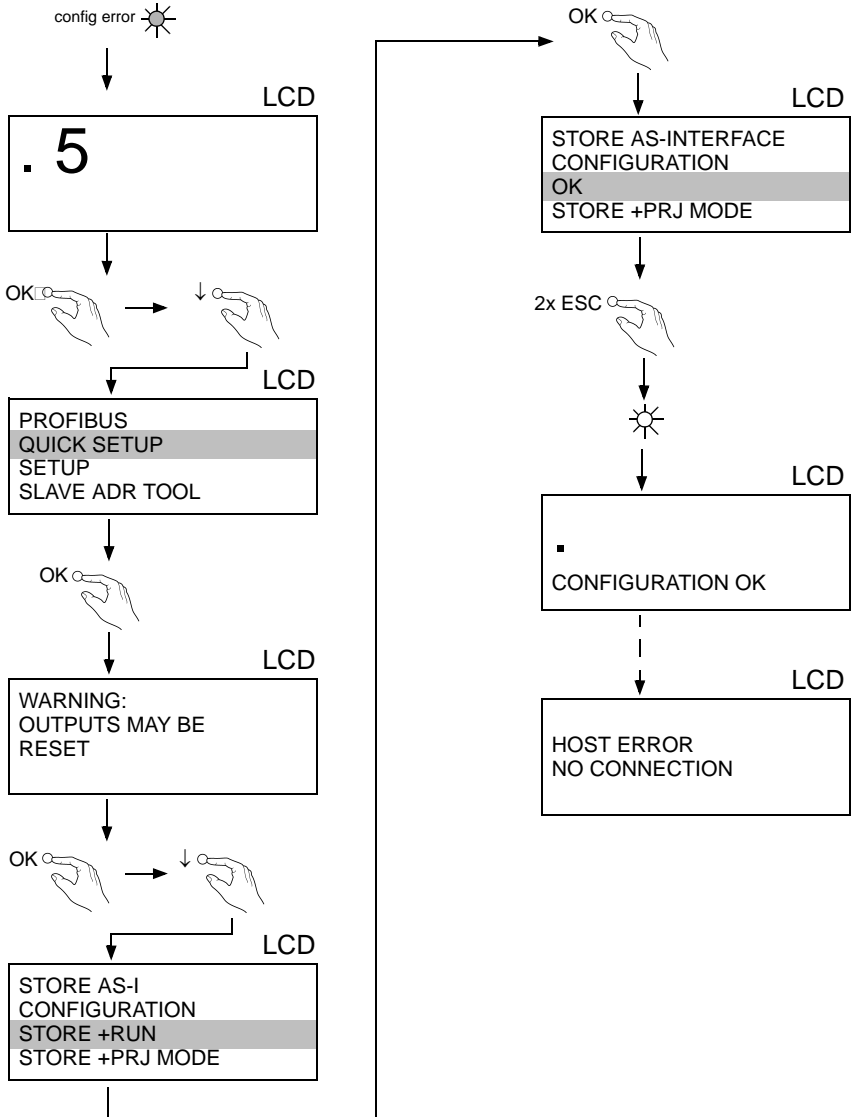
➔ Das Gerät ist werkseitig auf Adresse 3 eingestellt.  
The device is set to address 3 at the factory.  
L'appareil est réglé en usine à l'adresse 3.  
L'apparecchio è messo all'indirizzo 3 dalla fabbrica.  
El aparato viene ajustado de fábrica con la dirección 3.

**13.2.5 Connecting AS-i Slaves**



Ausgabedatum: 10.1.2008

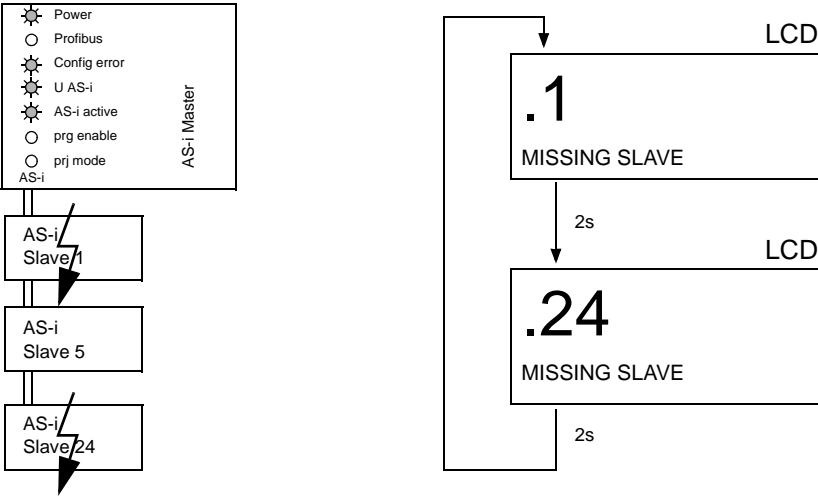
**13.2.6 Quick setup**



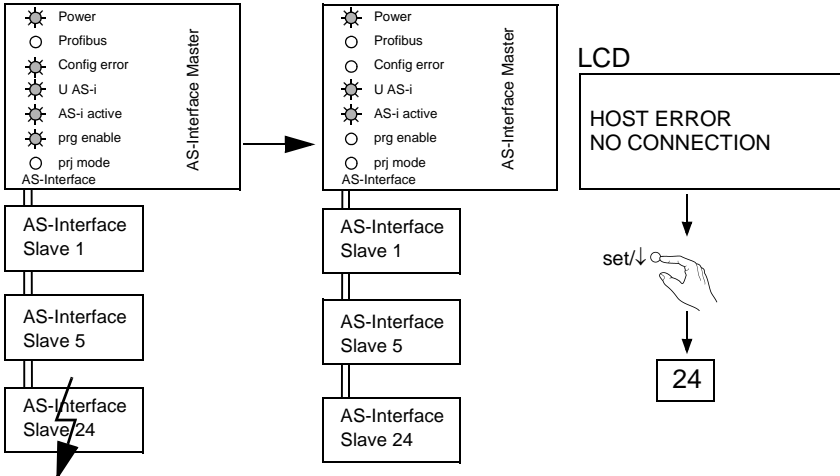
Ausgabedatum: 10.1.2008

**13.2.7 Error tracing**

**13.2.7.1 Faulty slaves**



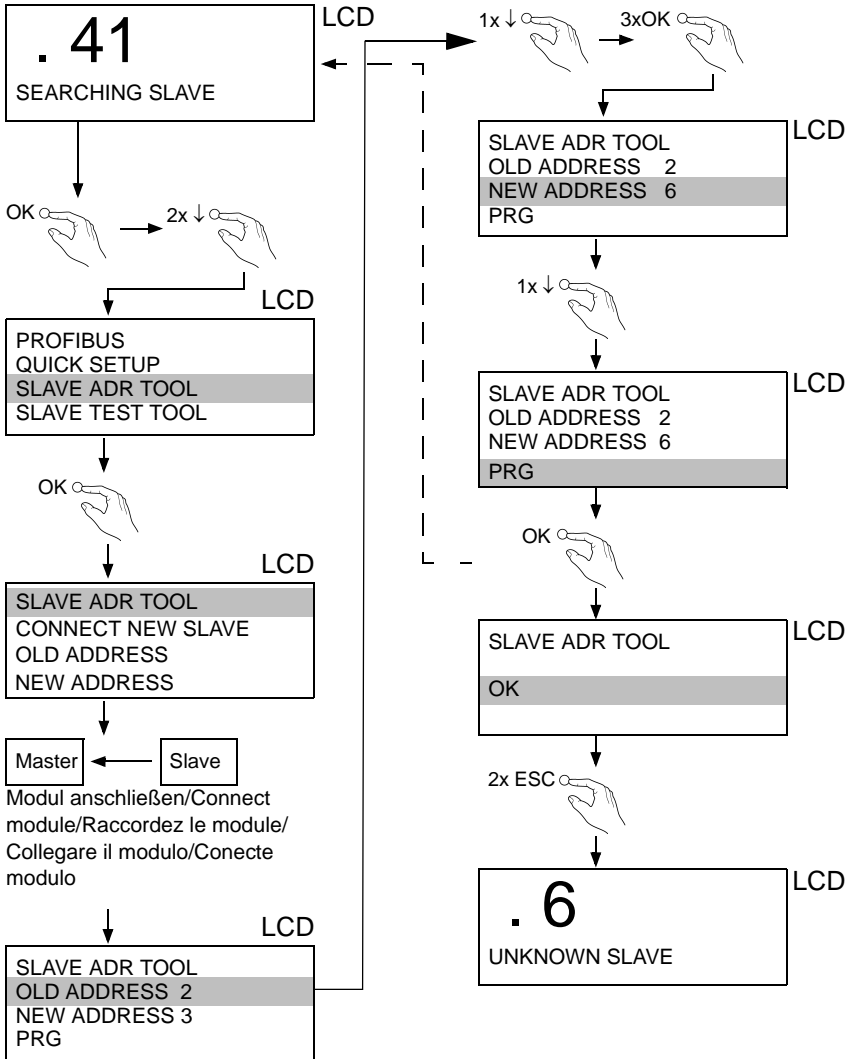
**13.2.7.2 Error display (last error)**





**13.2.8 Addressing**

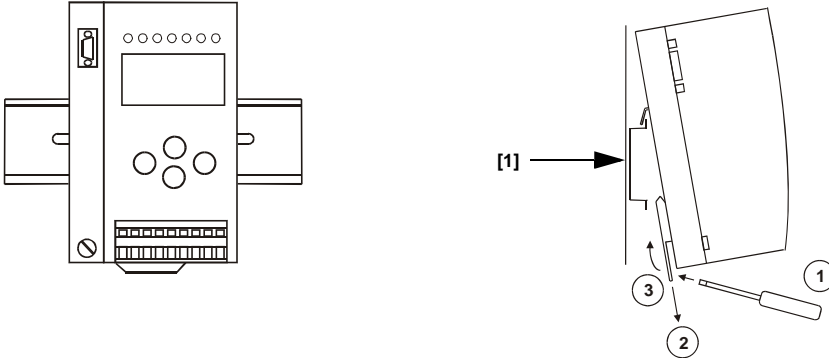
**13.2.8.3 Program slave 0 to address 4**



Ausgabedatum: 10.1.2008

### 13.2.9 Montage

- auf Montageplatte mit 35-mm-Hutschiene ①
- on mounting plate with 35 mm top-hat rail ①
- sur plaque de montage avec profilé-support 35 mm ①
- su piastra di montaggio con guida DIN 35 mm ①
- sobre placa de montaje con guía simétrica de 35 mm ①



### 13.2.10 Accessories

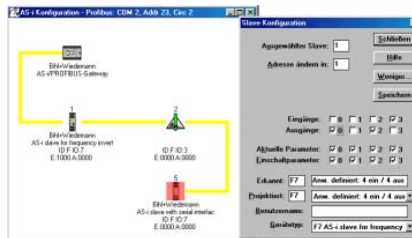
PC-Software „AS-i Control Tools“ mit serielllem Kabel zum Anschluss des AS-i Master in Edelstahl

Software "AS-i Control Tools" with serial cable for connection of the AS-i Master in stainless steel

Logiciel "AS-i Control Tools" avec câble série pour la connexion du maître AS-i en acier inox

Software PC "AS-i Control Tools" con cavo seriale per il collegamento del master AS-i d'acciaio inox

Software de PC "AS-i Control Tools" (no. de art. BW1602) con cable serial para la conexión del AS-i Master en acero inoxidable (no. de art. BW1602), master PROFIBUS serial (no. de art. BW1258)



### 13.3 Double Master (BWU1568 ... see chapter 13.1)

**AS-i 3.0 PROFIBUS-Gateway in Edelstahl**  
**AS-i 3.0 PROFIBUS Gateway in Stainless Steel**  
**Passerelle AS-i 3.0 PROFIBUS DP en boîtier inox**  
**Gateway AS-i 3.0 PROFIBUS d'acciaio inox**  
**Pasarela AS-i 3.0 PROFIBUS en acero inoxidable**



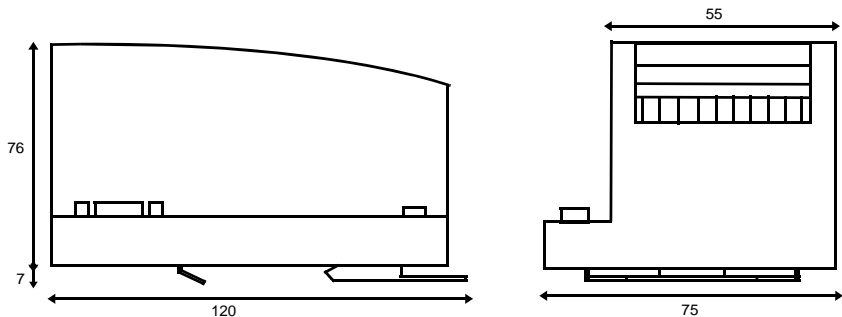
Dokumentation AS-i/PROFIBUS-Gateways (deutsch)  
 Documentation AS-i/PROFIBUS-Gateways (english)



Attention

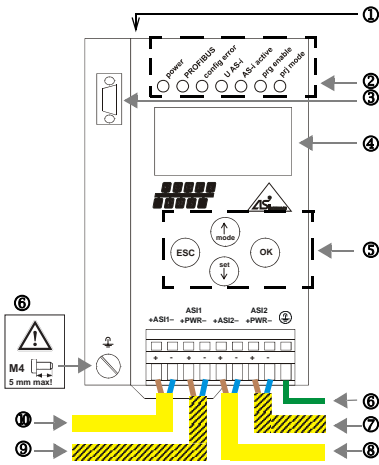
Die Geräte dürfen nur von Fachpersonal aufgebaut, angeschlossen und in Betrieb genommen werden! / Only qualified staff is allowed to mount, connect and set up the modules! / Les modules ne doivent être montés, raccordés et mis en service que par du personnel qualifié! / Gli apparecchi possono essere montati, collegati e messi in funzione soltanto da personale specializzato! / Los aparatos sólo pueden ser montados, conectados y puestos en servicio por personal técnico especializado!

#### 13.3.1 Dimensions



Ausgabedatum: 10.1.2008

13.3.2 Front view and connections



- ⑦ AS-i-Netzteil Kreis 2 / AS-i Power supply circuit 2 / Alimentation bus 2 AS-i / Alimentazione circuito 2 AS-i / Alimentación circuito 2 AS-i/Circuito AS-i 2
- ⑧ AS-i-Kreis 2/AS-i circuit 2/Bus AS-i 2/ Circuito AS-i 2
- ⑨ AS-i-Netzteil Kreis 1/AS-i Power supply circuit 1/ Alimentation bus 1 AS-i / Alimentazione circuito 1 AS-i / Alimentación circuito 1 AS-i/Circuito AS-i 1
- ⑩ AS-i-Kreis 1/AS-i circuit 1/Bus AS-i 1/ Circuito AS-i 1

Ambient operating temperature: 0° ... +55°C  
Tightening torque: 7 pound inches

- ① RS 232 Anschluss
- ② LED-Statusanzeige
- ③ PROFIBUS-Anschluss
- ④ LCD-Anzeige
- ⑤ Tasten für Handbedienung
- ⑥ Erde

- ① RS 232 connection
- ② LED status display
- ③ PROFIBUS connection
- ④ LCD display
- ⑤ Buttons for hand operation
- ⑥ Ground

- ① Raccordement RS 232
- ② Affichage d'état DEL
- ③ Raccordement PROFIBUS
- ④ Affichage LCD
- ⑤ Boutons pour commande manuelle
- ⑥ Terre

**Hinweis/Hint/Remarque/Indicazione/Nota**

AS-i-Kreis 1 und 2 werden aus AS-i-Netzteilen versorgt. Am Kabel für das Netzteil dürfen keine Slaves oder Repeater angeschlossen werden.

Am Kabel für den AS-i-Anschluss dürfen keine AS-i-Netzteile oder weitere Master angeschlossen werden.

AS i circuit 1 and 2 are supplied from AS-i power supplies. At the cable for power supply no slaves or repeaters may be attached.

At the cable for AS-i circuit no power supplies or further masters may be attached.

Les bus AS-i 1 et 2 sont alimentés par AS-i.

Au câble pour l'alimentation aucun esclave ou répéteur ne peut être raccordé.

Au câble pour le circuit AS-i aucune alimentation ou autre maître ne peut être raccordé.

I circuiti AS-i 1 e 2 sono alimentati da AS-i.

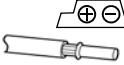
Al cavo per l'alimentazione nessun slave o ripetitore può essere fissato.

Al cavo per il circuito AS-i nessuna alimentazione o altro master può essere fissato.

Los circuitos AS-i 1 y 2 son alimentados de la fuente de poder AS-i.

En el cable de la alimentación AS-i no se deben conectar esclavos o repetidores.

En el cable del circuito AS-i no se debe conectar ninguna fuente de poder AS-i u otro master.



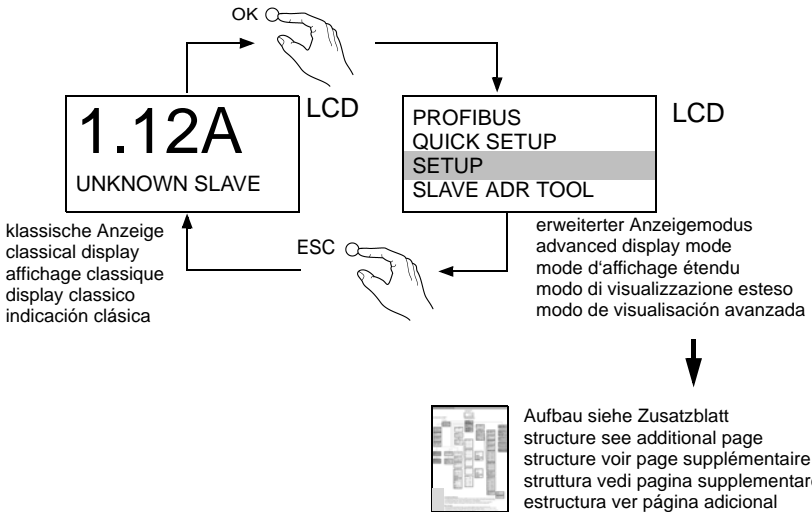
Temperature rating for cable: 60/75°C  
Use copper conductors only  
Ambient operating temperature: 0°C ... +55°C  
1 x 0.5 - 1.5 mm<sup>2</sup> (16AWG/kcmil: min. 24/max. 12)

- ① Collegamento RS 232
- ② Visualizzazione di stato LED
- ③ Collegamento PROFIBUS
- ④ Visualizzazione LCD
- ⑤ Pulsanti per le impostazioni manuali
- ⑥ Terra

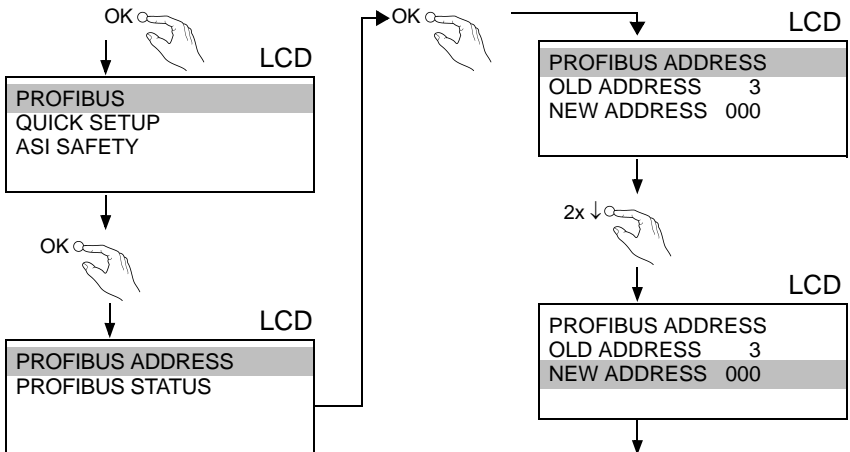
- ① Conexión RS 232
- ② LED visualización
- ③ Conexión PROFIBUS
- ④ Display LCD
- ⑤ Teclas para accionamiento manual
- ⑥ Tierra

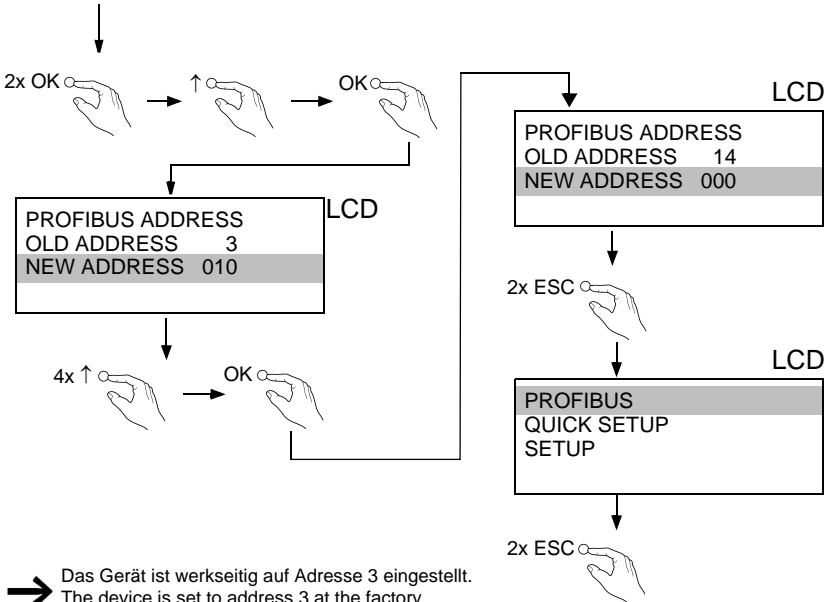
### 13.3.3 Startup

#### 13.3.3.4 Switching to advanced display mode



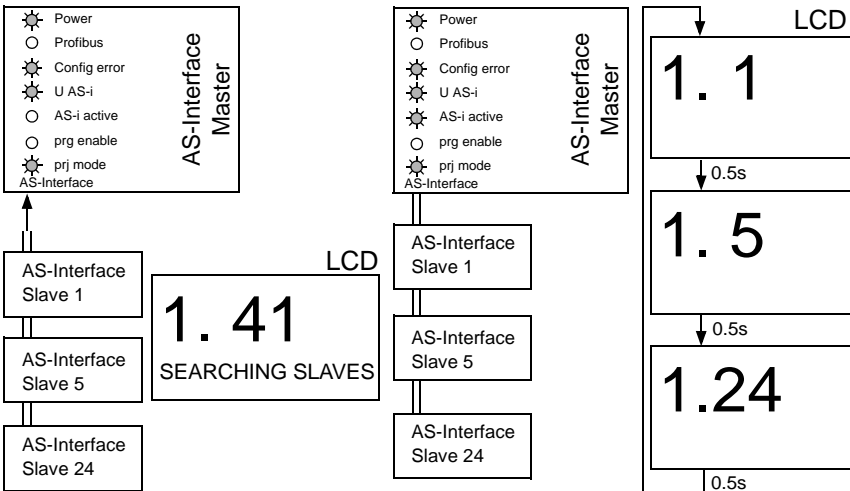
#### 13.3.4 Setting the PROFIBUS-DP address





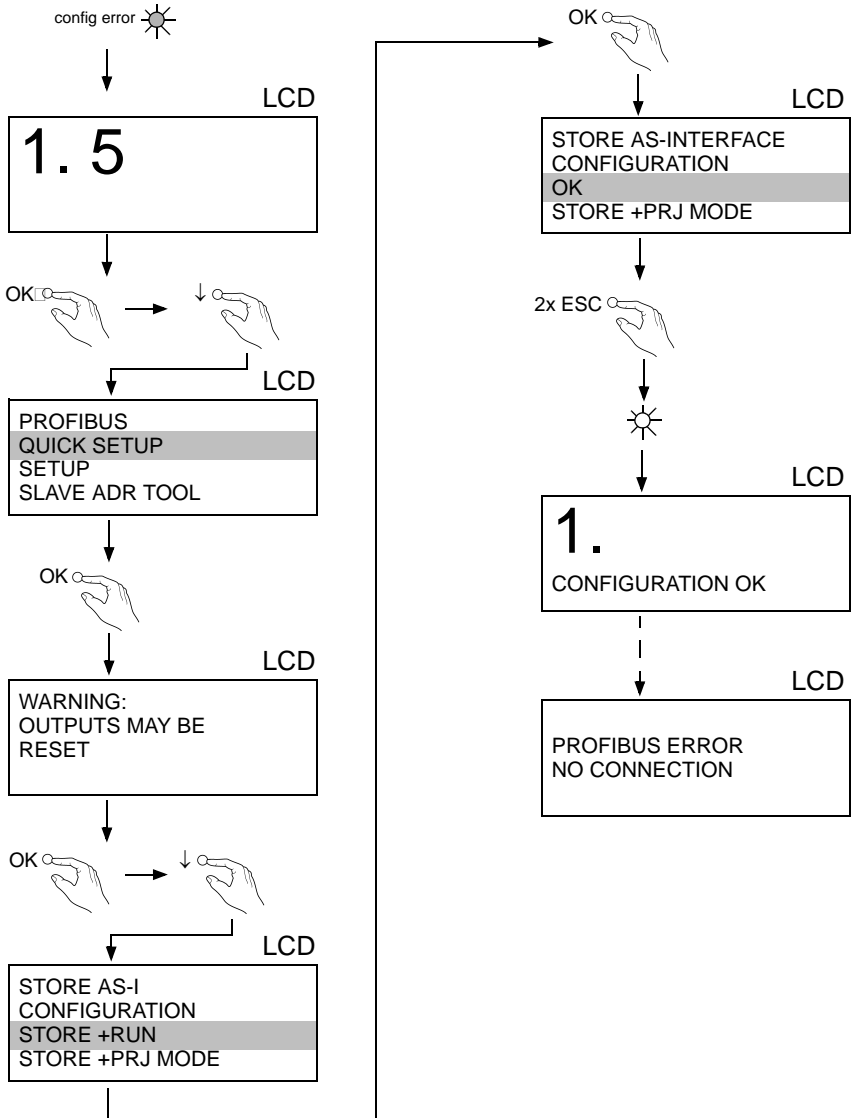
➔ Das Gerät ist werkseitig auf Adresse 3 eingestellt.  
 The device is set to address 3 at the factory.  
 L'appareil est réglé en usine à l'adresse 3.  
 L'apparecchio è messo all'indirizzo 3 dalla fabbrica.  
 El aparato viene ajustado de fábrica con la dirección 3.

**13.3.5 Connecting AS-i Slaves**



Ausgabedatum: 10.1.2008

**13.3.6 Quick setup**



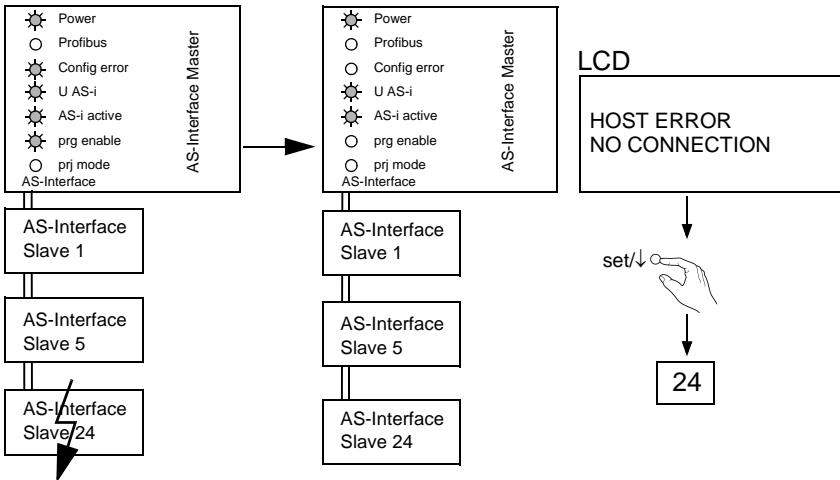
Ausgabedatum: 10.1.2008

### 13.3.7 Error tracing

#### 13.3.7.5 Faulty slaves



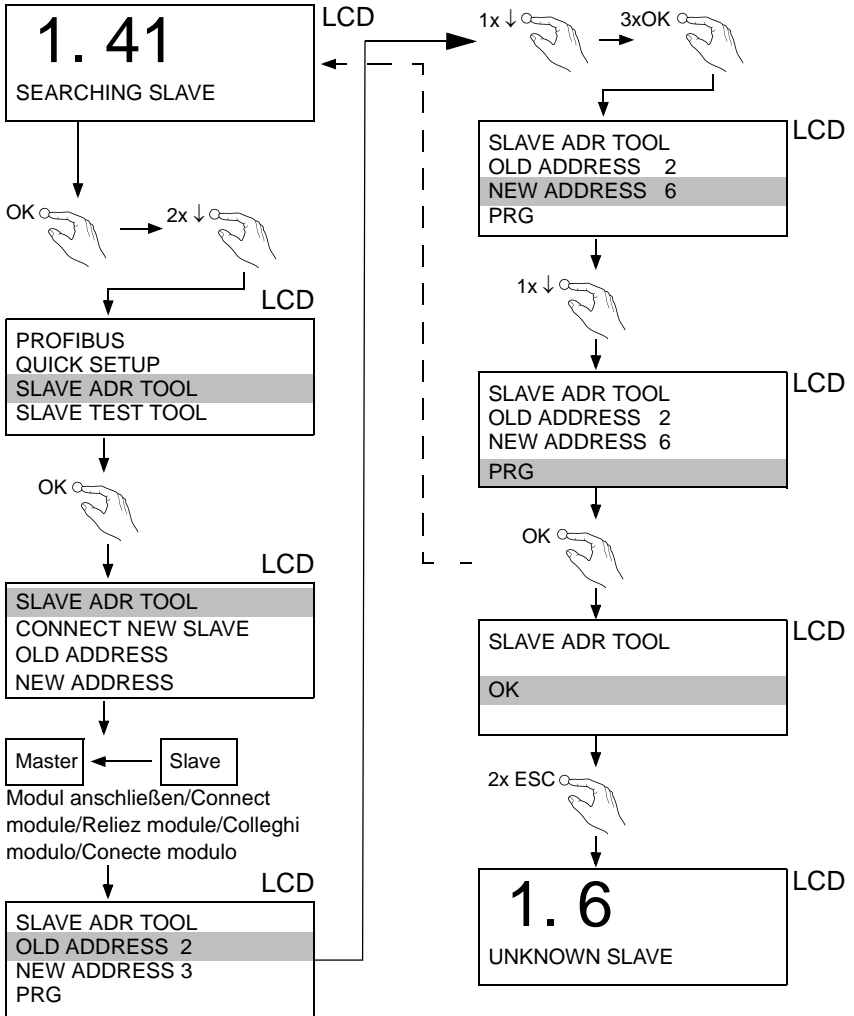
#### 13.3.7.6 Error display (last error)





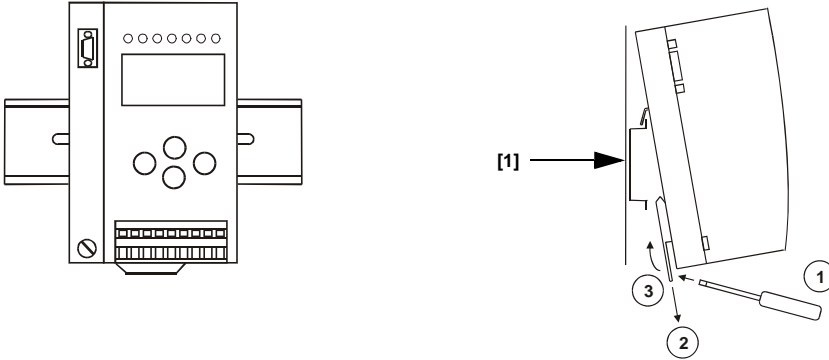
**13.3.8 Addressing**

**13.3.8.7 Programming slave 2 to address 6**



### 13.3.9 Montage

auf Montageplatte mit 35-mm-Hutschiene ①  
 on mounting plate with 35 mm top-hat rail ①  
 sur plaque de montage avec profilé-support 35 mm ①  
 su piastra di montaggio con guida DIN 35 mm ①  
 sobre placa de montaje con guía simétrica de 35 mm ①



### 13.3.10 Accessories

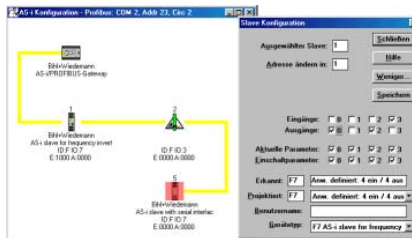
PC-Software „AS-i Control Tools“ mit seriellem Kabel zum Anschluss des AS-i Master in Edelstahl

Software "AS-i Control Tools" with serial cable for connection of the AS-i Master in stainless steel

Logiciel "AS-i Control Tools" avec câble série pour la connexion du maître AS-i en acier inox

Software PC "AS-i Control Tools" con cavo seriale per il collegamento del master AS-i d'acciaio inox

Software de PC "AS-i Control Tools" (no. de art. BW1602) con cable serial para la conexión del AS-i Master en acero inoxidable (no. de art. BW1602), master PROFIBUS serial (no. de art. BW1258)



### 13.4 Double Master (BWU1569 ... see chapter 13.1)

**AS-i 3.0 PROFIBUS-Gateway in Edelstahl**  
**AS-i 3.0 PROFIBUS Gateway in Stainless Steel**  
**Passerelle AS-i 3.0 PROFIBUS DP en boîtier inox**  
**Gateway AS-i 3.0 PROFIBUS d'acciaio inox**  
**Pasarela AS-i 3.0 PROFIBUS en acero inoxidable**



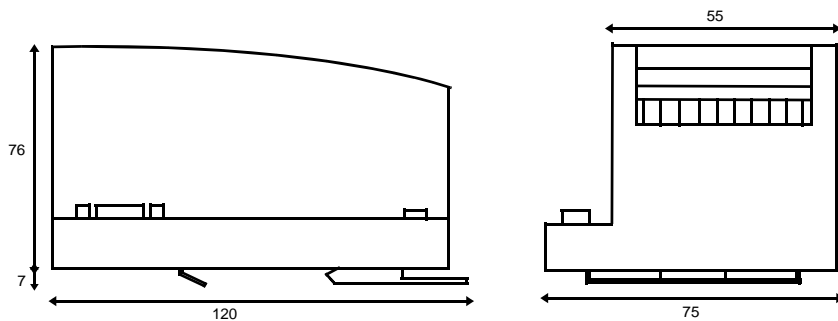
Dokumentation AS-i/PROFIBUS-Gateways (deutsch)  
 Documentation AS-i/PROFIBUS-Gateways (english)



Attention

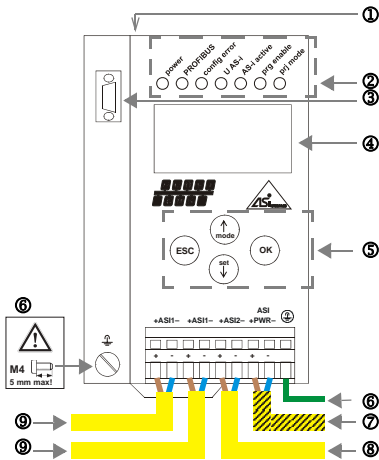
Die Geräte dürfen nur von Fachpersonal aufgebaut, angeschlossen und in Betrieb genommen werden! / Only qualified staff is allowed to mount, connect and set up the modules! / Les modules ne doivent être montés, raccordés et mis en service que par du personnel qualifié! / Gli apparecchi possono essere montati, collegati e messi in funzione soltanto da personale specializzato! / Los aparatos sólo pueden ser montados, conectados y puestos en servicio por personal técnico especializado!

#### 13.4.1 Dimensions



Ausgabedatum: 10.1.2008

## 13.4.2 Front view and connections



- ① AS-i-Netzteil / AS-i Power supply / Alimentation AS-i / Alimentazione AS-i / Alimentación AS-i  
 ② AS-i-Kreis 2/AS-i circuit 2/Bus AS-i 2/ Circuito AS-i 2/ Circuito AS-i 2  
 ③ AS-i-Kreis 1/AS-i circuit 1/Bus AS-i 1/ Circuito AS-i 1/ Circuito AS-i 1

Ambient operating temperature: 0° ... +55°C  
 Tightening torque: 7 pound inches

- ① RS 232 Anschluss  
 ② LED-Statusanzeige  
 ③ PROFIBUS-Anschluss  
 ④ LCD-Anzeige  
 ⑤ Tasten für Handbedienung  
 ⑥ Erde

- ① RS 232 connection  
 ② LED status display  
 ③ PROFIBUS connection  
 ④ LCD display  
 ⑤ Buttons for hand operation  
 ⑥ Ground

- ① Raccordement RS 232  
 ② Affichage d'état DEL  
 ③ Raccordement PROFIBUS  
 ④ Affichage LCD  
 ⑤ Boutons pour commande manuelle  
 ⑥ Terre

## Hinweis/Hint/Remarque/Indicazione/Nota

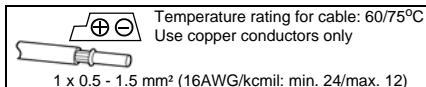
AS-i-Kreis 1 und 2 werden beide aus einem Netzteil von Bihl+Wiedemann versorgt. Andere Netzteile sind nicht freigegeben! Am Kabel für das Netzteil dürfen keine Slaves oder Repeater angeschlossen werden. Am Kabel für den AS-i-Anschluss dürfen keine AS-i-Netzteile oder weitere Master angeschlossen werden.

AS-i circle 1 and 2 are both supplied via a Bihl+Wiedemann power supply. Other power supplies are not released for use! At the cable for power supply no slaves or repeaters may be attached. At the cable for AS-i circuit no power supplies or further masters may be attached.

Les bus AS-i 1 et 2 sont tous les deux alimentés à partir d'une alimentation de Bihl+Wiedemann. D'autres alimentations ne sont pas admises pour l'usage! Au câble pour l'alimentation aucun esclave ou répéteur ne peut être raccordé. Au câble pour le circuit AS-i aucune alimentation ou autre maître ne peut être raccordé.

I circuiti AS-i 1 e 2 sono entrambi alimentati da un alimentatore di Bihl+Wiedemann. Altri alimentatori non sono ammessi per l'uso! Al cavo per il circuito AS-i nessuna alimentazione o nessun altro master può essere fissato.

Los circuitos AS-i 1 y 2 son alimentados de una fuente de poder de Bihl+Wiedemann. Otras fuentes de poder no son permitidas! En el cable de la alimentación AS-i no se deben conectar esclavos o repetidores. En el cable del circuito AS-i no se debe conectar ninguna fuente de poder AS-i u otro master.

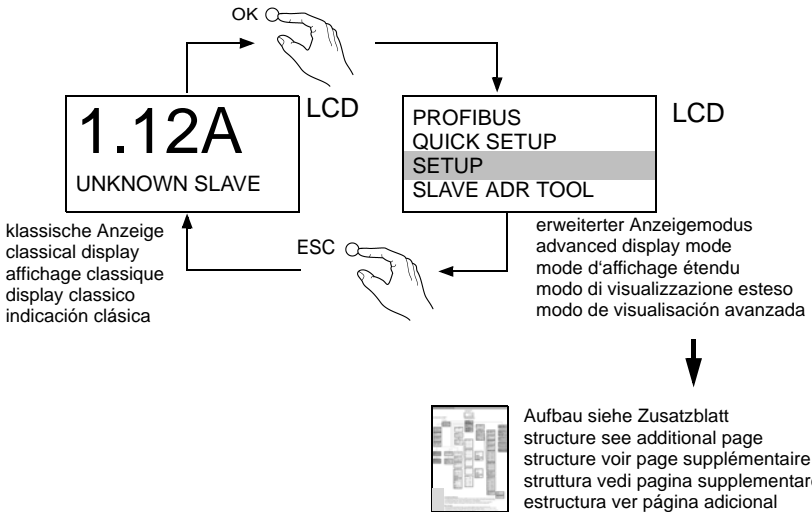


- ① Collegamento RS 232  
 ② Visualizzazione di stato LED  
 ③ Collegamento PROFIBUS  
 ④ Visualizzazione LCD  
 ⑤ Pulsanti per le impostazioni manuali  
 ⑥ Terra

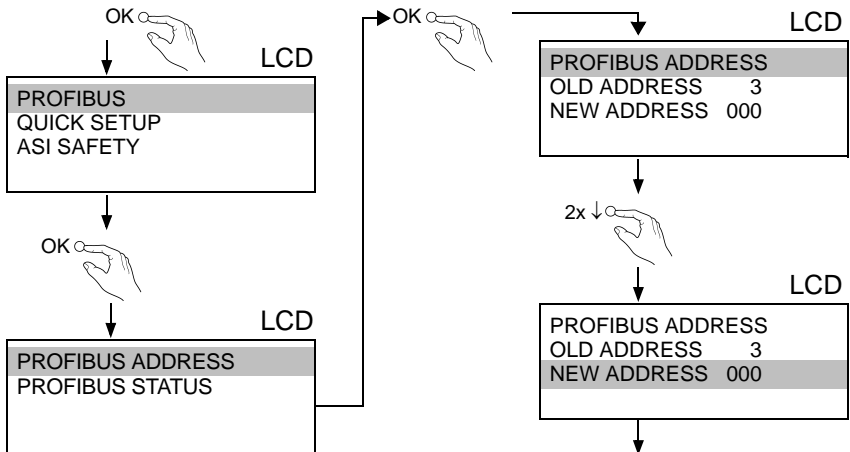
- ① Conexión RS 232  
 ② LED visualización  
 ③ Conexión PROFIBUS  
 ④ Display LCD  
 ⑤ Teclas para accionamiento manual  
 ⑥ Tierra

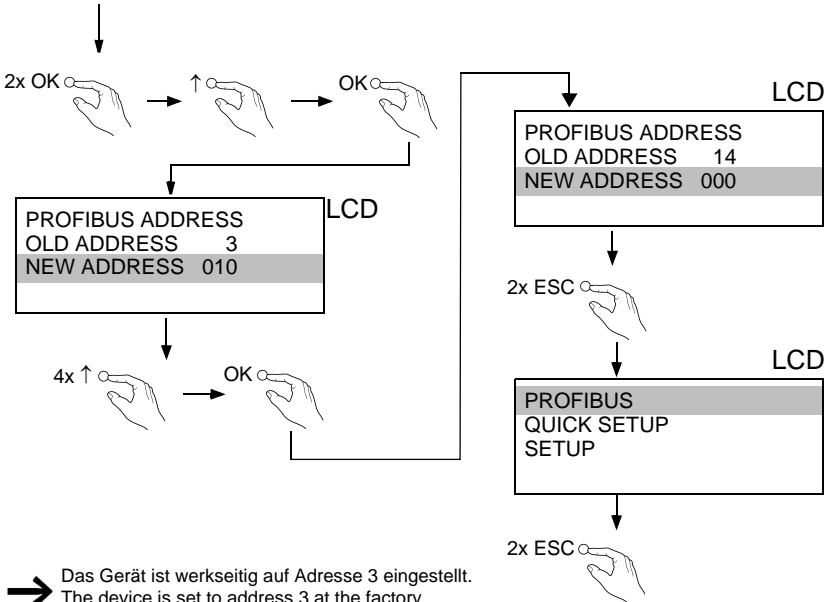
### 13.4.3 Startup

#### 13.4.3.8 Switching to advanced display mode



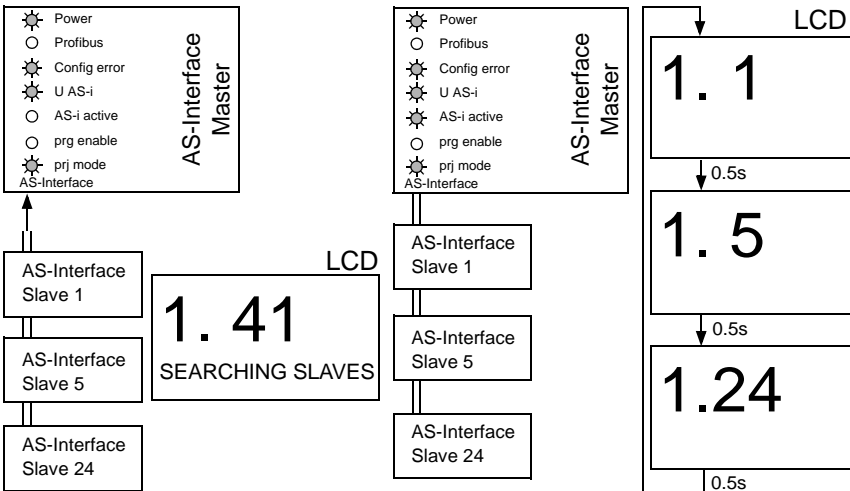
#### 13.4.4 Setting the PROFIBUS-DP address





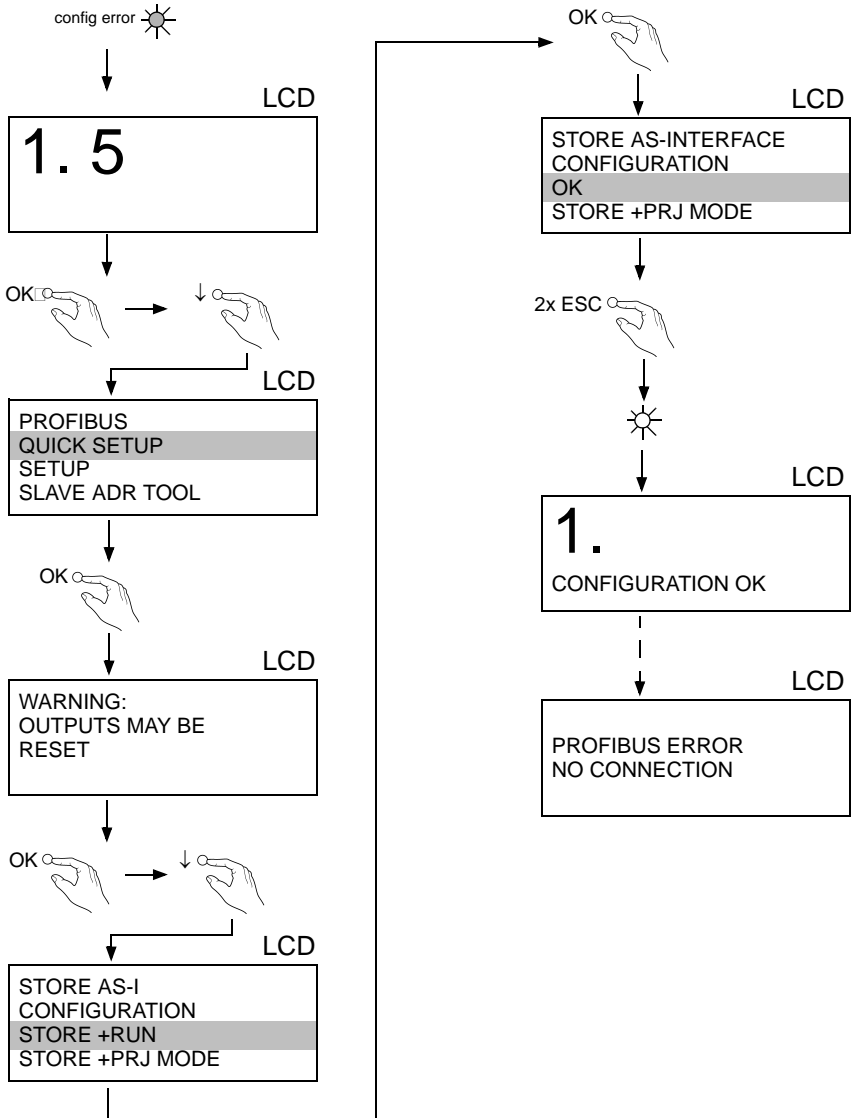
➔ Das Gerät ist werkseitig auf Adresse 3 eingestellt.  
 The device is set to address 3 at the factory.  
 L'appareil est réglé en usine à l'adresse 3.  
 L'apparecchio è messo all'indirizzo 3 dalla fabbrica.  
 El aparato viene ajustado de fábrica con la dirección 3.

**13.4.5 Connect AS-i Slaves**



Ausgabedatum: 10.1.2008

**13.4.6 Quick setup**



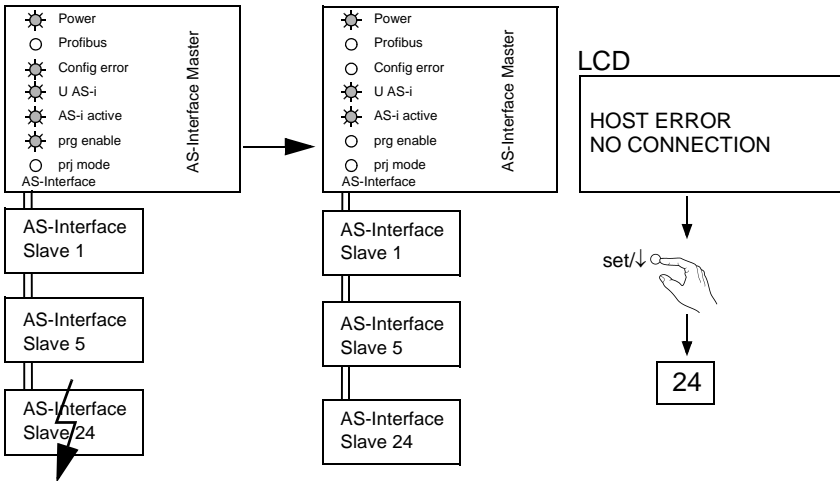
Ausgabedatum: 10.1.2008

**13.4.7 Error tracing**

**13.4.7.9 Faulty slaves**



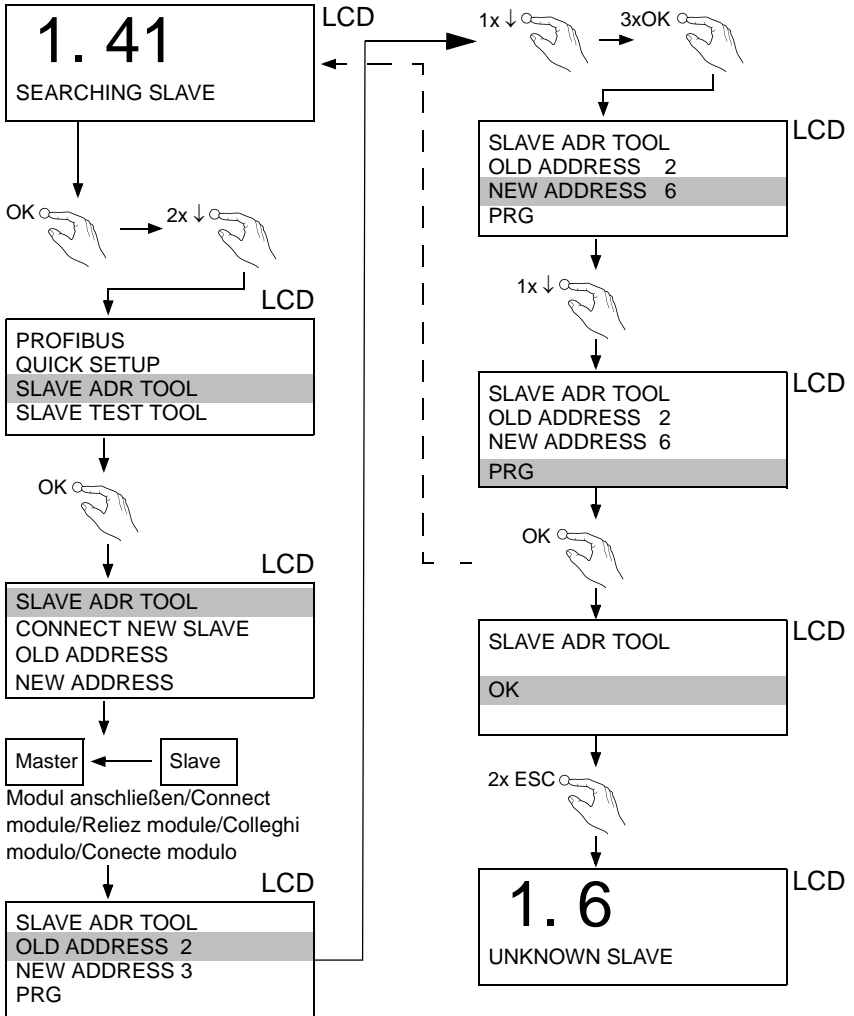
**13.4.7.10 Error display (last error)**





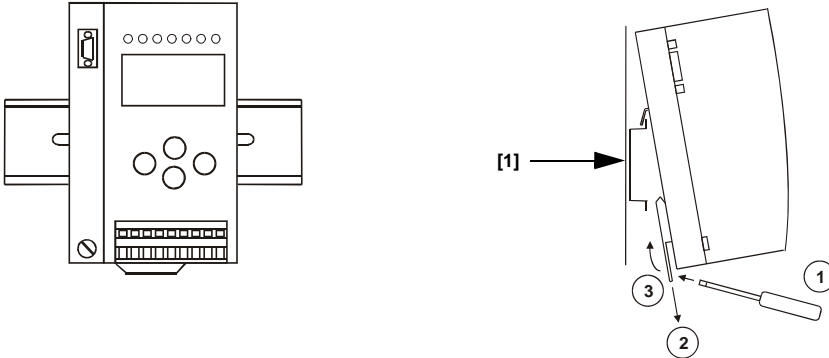
**13.4.8 Addressing**

**13.4.8.11 Programming slave 2 to address 6**



### 13.4.9 Montage

auf Montageplatte mit 35-mm-Hutschiene ①  
 on mounting plate with 35 mm top-hat rail ①  
 sur plaque de montage avec profilé-support 35 mm ①  
 su piastra di montaggio con guida DIN 35 mm ①  
 sobre placa de montaje con guía simétrica de 35 mm ①



### 13.4.10 Accessories

Netzteil 4 A (Art.-Nr. BW1592)/8 A (Art.-Nr. BW1593)

Power supply 4 A (art. no. BW1592)/8 A (art. no. BW1593)

Alimentation 4 A (n° art. BW1592)/8 A (n° art. BW1593)

Alimentazione 4 A (cod. art. BW1592)/8 A (cod. art. BW1593)

Fuente de poder 4 A (no. del art. BW1592)/8 A (no. del art. BW1593)

PC-Software „AS-i Control Tools“ mit seriellen Kabel zum Anschluss des AS-i Master in Edelstahl

Software "AS-i Control Tools" with serial cable for connection of the AS-i Master in stainless steel

Logiciel "AS-i Control Tools" avec câble série pour la connexion du maître AS-i en acier inox

Software PC "AS-i Control Tools" con cavo seriale per il collegamento del master AS-i d'acciaio inox

Software de PC "AS-i Control Tools" (no. de art. BW1602) con cable serial para la conexión del AS-i Master en acero inoxidable (no. de art. BW1602), master PROFIBUS serial (no. de art. BW1258)

### 13.5 Single Master (BWU1991 ... see chapter 13.1)

**AS-i 3.0 PROFIBUS-Gateway in Edelstahl**  
**AS-i 3.0 PROFIBUS Gateway in Stainless Steel**  
**Passerelle AS-i 3.0 PROFIBUS DP en boîtier inox**  
**Gateway AS-i 3.0 PROFIBUS d'acciaio inox**  
**Pasarela AS-i 3.0 PROFIBUS en acero inoxidable**



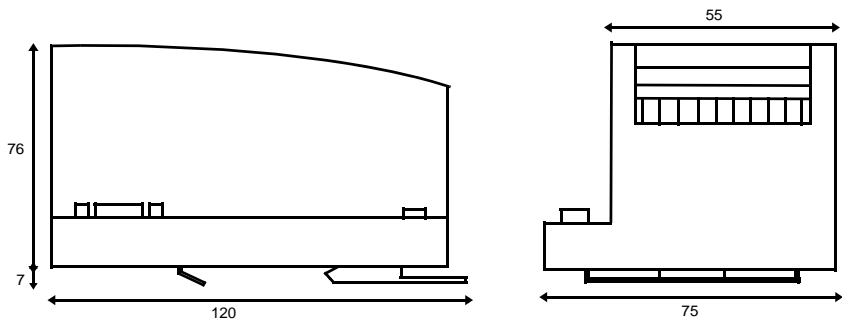
Dokumentation AS-i/PROFIBUS-Gateways (deutsch)  
 Documentation AS-i/PROFIBUS-Gateways (english)



Attention

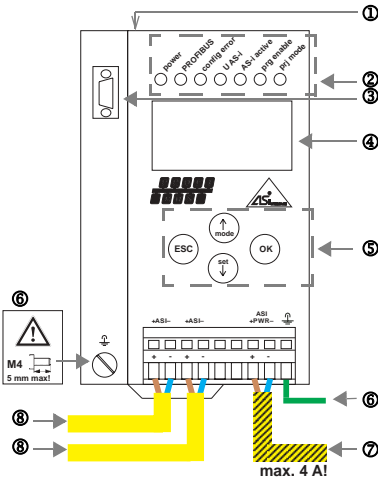
Die Geräte dürfen nur von Fachpersonal aufgebaut, angeschlossen und in Betrieb genommen werden! / Only qualified staff is allowed to mount, connect and set up the modules! / Les modules ne doivent être montés, raccordés et mis en service que par du personnel qualifié! / Gli apparecchi possono essere montati, collegati e messi in funzione soltanto da personale specializzato! / Los aparatos sólo pueden ser montados, conectados y puestos en servicio por personal técnico especializado!

#### 13.5.1 Dimensions



Ausgabedatum: 10.1.2008

### 13.5.2 Front view and connections



- ⑦ Netzteil/ Power supply/ Alimentation/ Alimentatore/ Alimentación
- ⑥ AS-i-Kreis /AS-i circuit /Bus AS-i / Circuito AS-i / Circuito AS-i

- ① RS 232 Anschluss
- ② LED-Statusanzeige
- ③ PROFIBUS-Anschluss
- ④ LCD-Anzeige
- ⑤ Tasten für Handbedienung
- ⑥ Erde

- ① Raccordement RS 232
- ② Affichage d'état DEL
- ③ Raccordement PROFIBUS
- ④ Affichage LCD
- ⑤ Boutons pour commande manuelle
- ⑥ Terre

#### Hinweis/Hint/Remarque/Nota/Nota

Am Kabel für das Netzteil dürfen keine Slaves oder Repeater angeschlossen werden.

Am Kabel für den AS-i-Anschluss dürfen keine AS-i-Netzteile oder weitere Master angeschlossen werden.

At the cable for power supply no slaves or repeaters may be attached.

At the cable for AS-i circuit no power supplies or further masters may be attached.

Au câble pour l'alimentation aucun esclave ou répéteur ne peut être raccordé.

Au câble pour le circuit AS-i aucune alimentation ou autre maître ne peut être raccordé.

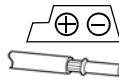
Al cavo per l'alimentazione nessun slave o ripetitore può essere fissato.

Al cavo per il circuito AS-i nessun alimentatore o altro master può essere fissato.

En el cable de la alimentación AS-i no se deben conectar esclavos o repetidores.

En el cable del circuito AS-i no se debe conectar ninguna fuente de poder AS-i u otro master.

Ambient operating temperature: 0° ... +55°C  
Tightening torque: 7 pound inches



Temperature rating for cable: 60/75°C  
Use copper conductors only

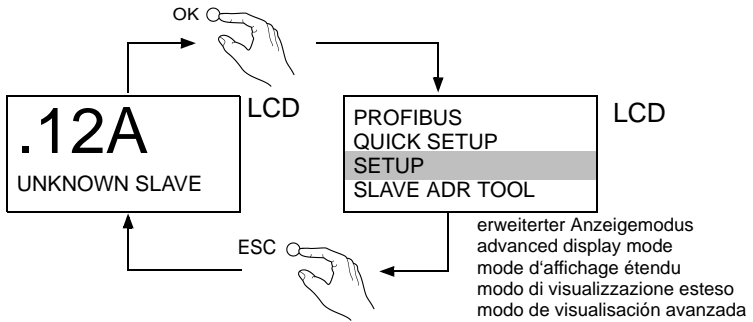
1 x 0.5 - 1.5 mm<sup>2</sup> (16AWG/kcmil: min. 24/max.12)

- ① Collegamento RS 232
- ② Visualizzazione di stato LED
- ③ Collegamento PROFIBUS
- ④ Visualizzazione LCD
- ⑤ Pulsanti per le impostazioni manuali
- ⑥ Terra

- ① Conexión RS 232
- ② LED visualización
- ③ Conexión PROFIBUS
- ④ Display LCD
- ⑤ Teclas para accionamiento manual
- ⑥ Tierra

**13.5.3 Startup**

**13.5.3.12 Switching to advanced display mode**

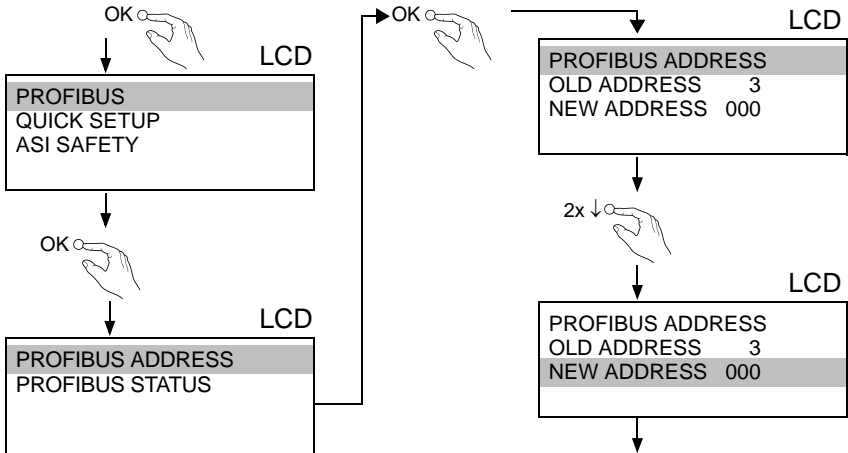


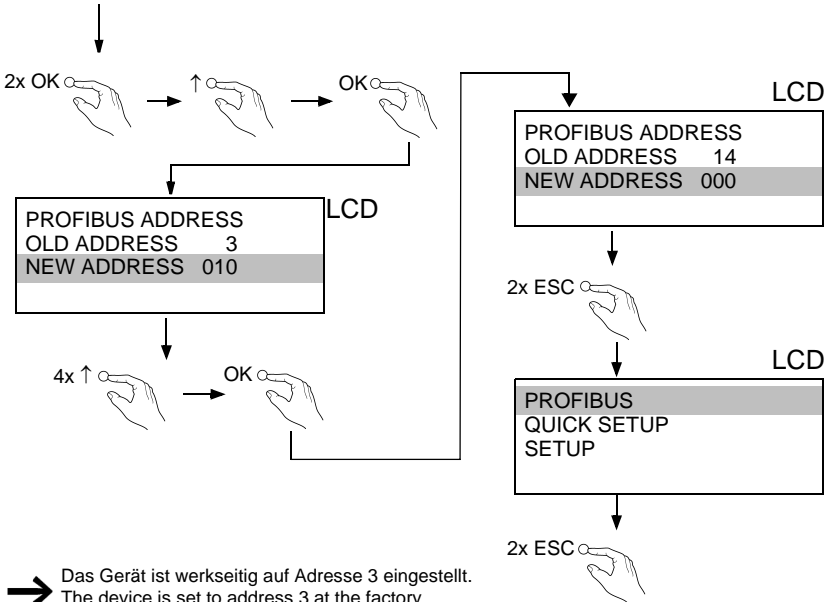
klassische Anzeige  
classical display  
affichage classique  
display classico  
indicación clásica



Aufbau siehe Zusatzblatt  
structure see additional page  
structure voir page supplémentaire  
struttura vedi pagina supplementare  
estructura ver página adicional

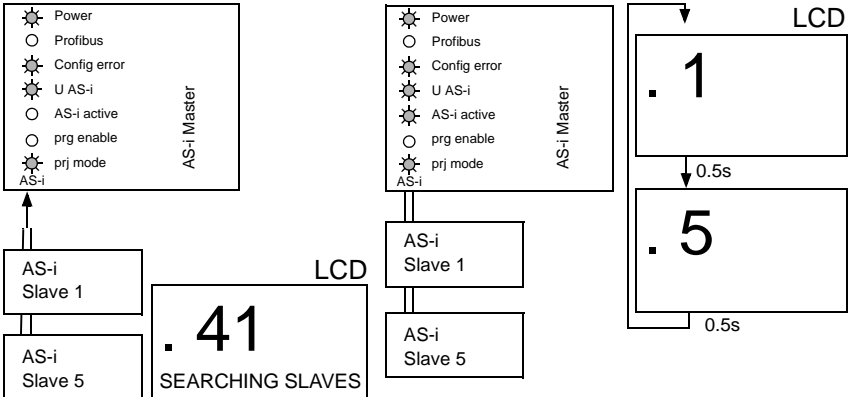
**13.5.4 Setting the PROFIBUS-DP address**





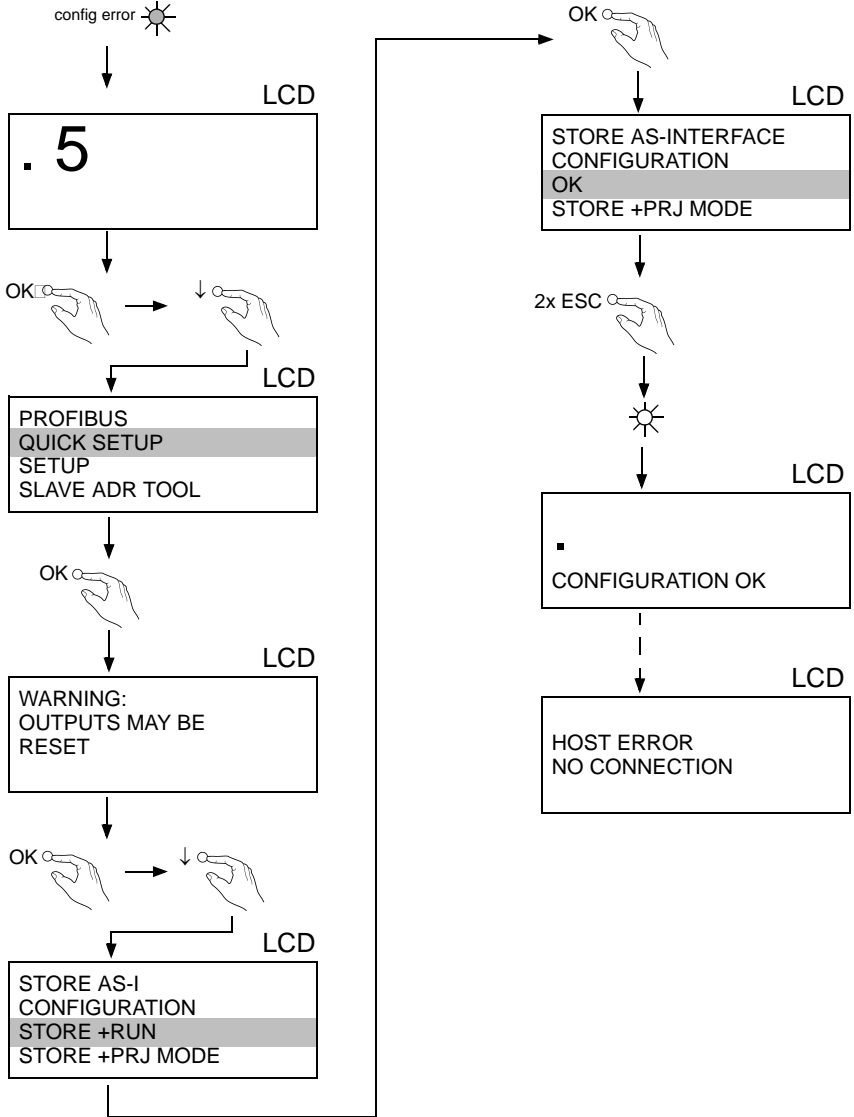
➔ Das Gerät ist werkseitig auf Adresse 3 eingestellt.  
 The device is set to address 3 at the factory.  
 L'appareil est réglé en usine à l'adresse 3.  
 L'apparecchio è messo all'indirizzo 3 dalla fabbrica.  
 El aparato viene ajustado de fábrica con la dirección 3.

**13.5.5 Connecting AS-i Slaves**



Ausgabedatum: 10.1.2008

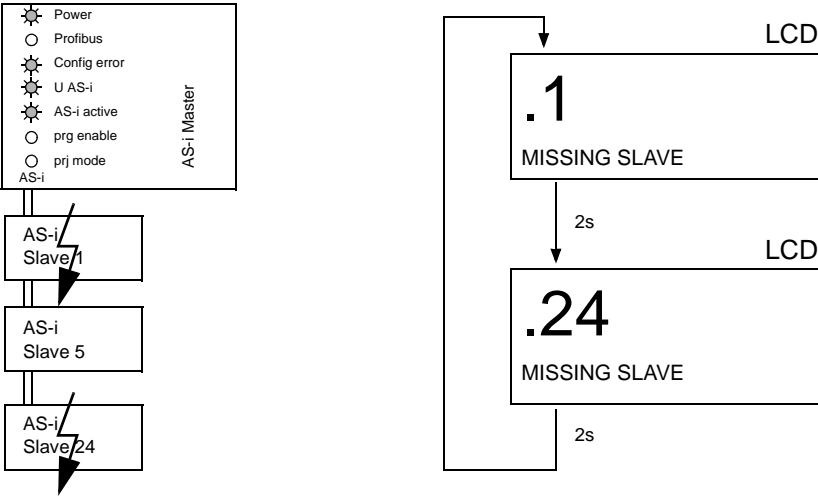
**13.5.6 Quick setup**



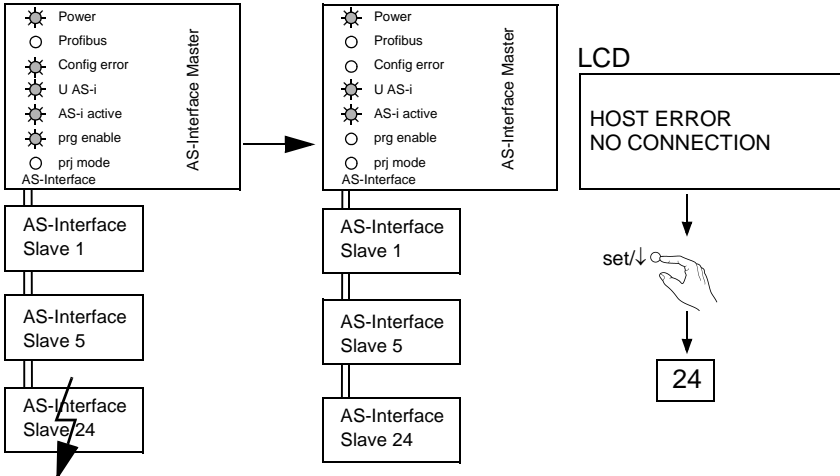
Ausgabedatum: 10.1.2008

**13.5.7 Error tracing**

**13.5.7.13 Faulty slaves**



**13.5.7.14 Error display (last error)**

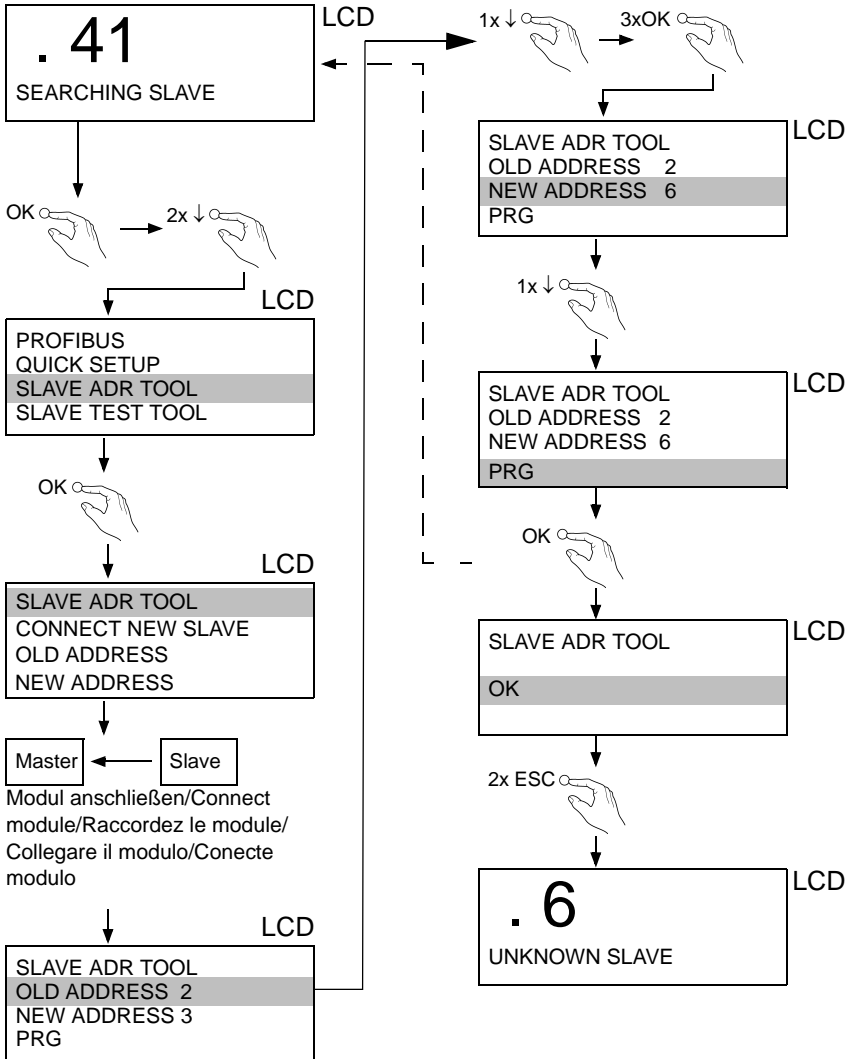


Ausgabedatum: 10.1.2008



**13.5.8 Addressing**

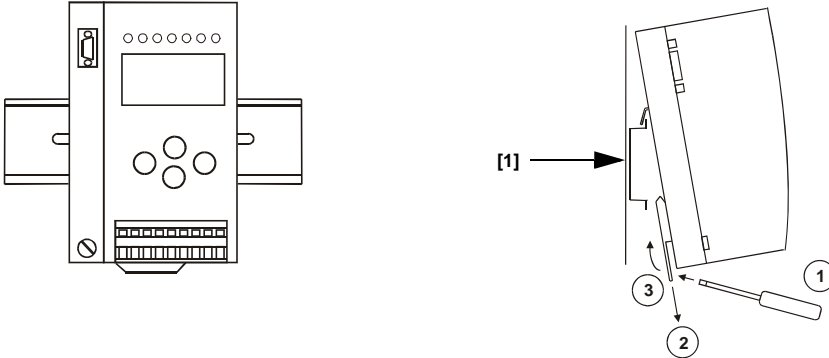
**13.5.8.15 Program slave 2 to address 6**



Ausgabedatum: 10.1.2008

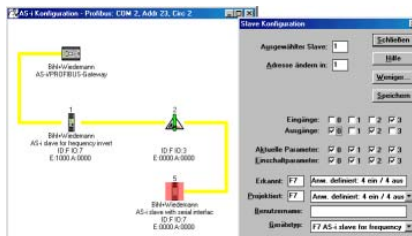
### 13.5.9 Montage

- auf Montageplatte mit 35-mm-Hutschiene ①
- on mounting plate with 35 mm top-hat rail ①
- sur plaque de montage avec profilé-support 35 mm ①
- su piastra di montaggio con guida DIN 35 mm ①
- sobre placa de montaje con guía simétrica de 35 mm ①



### 13.5.10 Accessories

- (Art.-Nr. BW1649)(art. no. BW1649)(n° art. BW1649)(no. del art. BW1649)(no. del art. BW1649)
- PC-Software „AS-i Control Tools“ mit seriellem Kabel zum Anschluss des AS-i Master in Edelstahl (Art.-Nr. BW1602), serieller PROFIBUS-Master (Art.-Nr. BW1258)  
Software "AS-i Control Tools" with serial cable for connection of the AS-i Master in stainless steel (art. no. BW1602), serial PROFIBUS Master (art. no. BW1258)  
Logiciel "AS-i Control Tools" avec câble série pour la connexion du maître AS-i en acier inox (n° art. BW1602), maître PROFIBUS série (n° art. BW1258)  
Software PC "AS-i Control Tools" con cavo seriale per il collegamento del master AS-i d'acciaio inox (cod. art. BW1602), master seriale PROFIBUS (cod. art. BW1258)  
Software de PC "AS-i Control Tools" (no. de art. BW1602) con cable serial para la conexión del AS-i Master en acero inoxidable (no. de art. BW1602), master PROFIBUS serial (no. de art. BW1258)



### 13.6 Basic Master (BWU1746 ... see chapter 13.1)

**AS-i 3.0 PROFIBUS-Gateway in Edelstahl**  
**AS-i 3.0 PROFIBUS Gateway in Stainless Steel**  
**Passerelle AS-i 3.0 PROFIBUS DP en boîtier inox**  
**Gateway AS-i 3.0 PROFIBUS d'acciaio inox**  
**Pasarela AS-i 3.0 PROFIBUS en acero inoxidable**



Dokumentation AS-i/PROFIBUS-Gateways (deutsch)

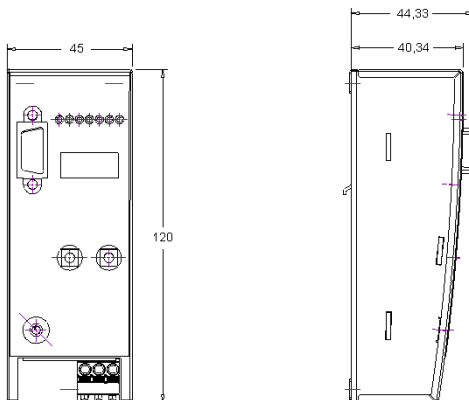
Documentation AS-i/PROFIBUS-Gateways (english)



**Attention**

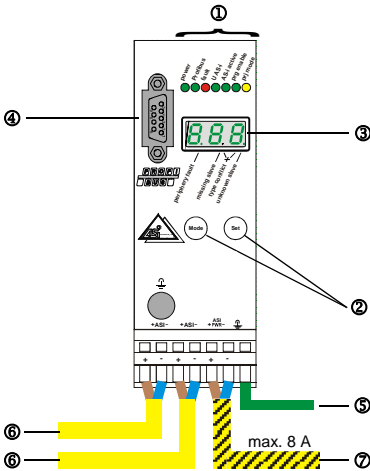
Die Geräte dürfen nur von Fachpersonal aufgebaut, angeschlossen und in Betrieb genommen werden! / Only qualified staff is allowed to mount, connect and set up the modules! / Les modules ne doivent être montés, raccordés et mis en service que par du personnel qualifié! / Gli apparecchi possono essere montati, collegati e messi in funzione soltanto da personale specializzato! / Los aparatos sólo pueden ser montados, conectados y puestos en servicio por personal técnico especializado!

#### 13.6.1 Dimensions



Ausgabedatum: 10.1.2008

### 13.6.2 Front view and connections



Ambient operating temperature: 0° ... +55°C  
Tightening torque: 7 pound inches

- ① LED-Statusanzeige
- ② Tasten für Handbedienung
- ③ LED-Anzeige
- ④ PROFIBUS-Anschluss
- ⑤ Erde
- ⑥ AS-i-Kreis
- ⑦ AS-i-Netzteil

- ① LED status display
- ② Buttons for hand operation
- ③ LED display
- ④ PROFIBUS connection
- ⑤ Ground
- ⑥ AS-i circuit
- ⑦ AS-i power supply

- ① Affichage d'état DEL
- ② Boutons pour commande manuelle
- ③ Affichage LED
- ④ Raccordement PROFIBUS
- ⑤ Terre
- ⑥ Circuito AS-i
- ⑦ Alimentation AS-i

#### Hinweis/Hint/Remarque/Indicazione/Nota

Am Kabel für das Netzteil dürfen keine Slaves oder Repeater angeschlossen werden.

Am Kabel für den AS-i-Anschluss dürfen keine AS-i-Netzteile oder weitere Master angeschlossen werden.

At the cable for power supply no slaves or repeaters may be attached.

At the cable for AS-i circuit no power supplies or further masters may be attached.

Au câble pour l'alimentation aucun esclave ou répéteur ne peut être raccordé.

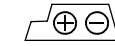
Au câble pour le circuit AS-i aucune alimentation ou autre maître ne peut être raccordé.

Al cavo per l'alimentazione nessun slave o ripetitore può essere fissato.

Al cavo per il circuito AS-i nessun alimentatore o altro master può essere fissato.

En el cable de la alimentación no se deben conectar esclavos o repetidores.

En el cable del circuito AS-i no se debe conectar ninguna fuente de poder AS-i u otro master.



Temperature rating for cable: 60/75°C  
Use copper conductors only

1 x 0.5 - 1.5 mm<sup>2</sup> (16AWG/kcmil: min. 24/max.12)

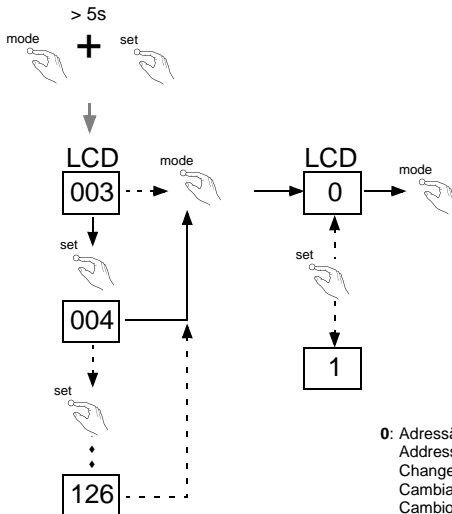
- ① Visualizzazione di stato LED
- ② Pulsanti per le impostazioni manuali
- ③ Visualizzazione LED
- ④ Collegamento PROFIBUS
- ⑤ Terra
- ⑥ Circuito AS-i
- ⑦ Alimentazione AS-i

- ① Visualización LED
- ② Teclas para accionamiento manual
- ③ Indicación LED
- ④ Conexión PROFIBUS
- ⑤ Tierra
- ⑥ Circuito AS-i
- ⑦ Alimentación AS-i

### 13.6.3 Startup

 <b>Note</b>	<p>Wenn PROFIBUS aktiv, keine Konfigurationsänderung über Taster!          If PROFIBUS active, no configuration settings by push buttons!          Activité PROFIBUS, pas de changement de configuration via touches!          Attività PROFIBUS, nessun cambiamento di configurazione tramite tasti!          Si PROFIBUS activo, ningunos ajustes de la configuración por los botones!</p>
-----------------	--

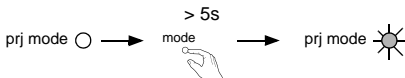
#### 13.6.3.16 Setting the PROFIBUS-DP address



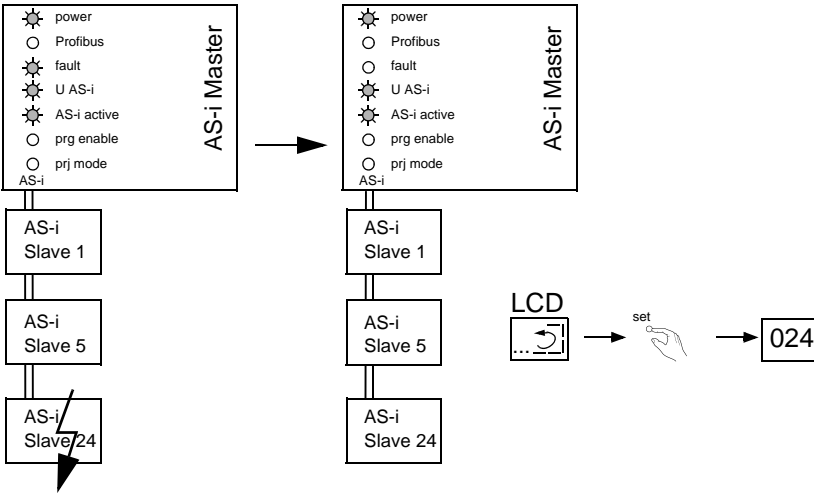
Das Gerät ist werkseitig auf Adresse 3 eingestellt.  
 The device is set to address 3 at the factory.  
 L'appareil est réglé en usine à l'adresse 3.  
 L'apparecchio è messo sull'indirizzo 3 dalla fabbrica.  
 El aparato viene ajustado de fábrica en la dirección 3.

- 0:** Adressänderung über PROFIBUS ist gesperrt (default).  
 Address change via PROFIBUS is locked (default).  
 Changement d'adresse via PROFIBUS est bloqué (default).  
 Cambiamento di indirizzo è bloccato via PROFIBUS (default).  
 Cambio de la dirección es bloqueado vía PROFIBUS (default).
- 1:** Adressänderung über PROFIBUS ist erlaubt.  
 Address change via PROFIBUS is allowed.  
 Changement d'adresse via PROFIBUS est permis.  
 Cambiamento di indirizzo tramite PROFIBUS è permesso.  
 Cambio de la dirección se permite vía PROFIBUS

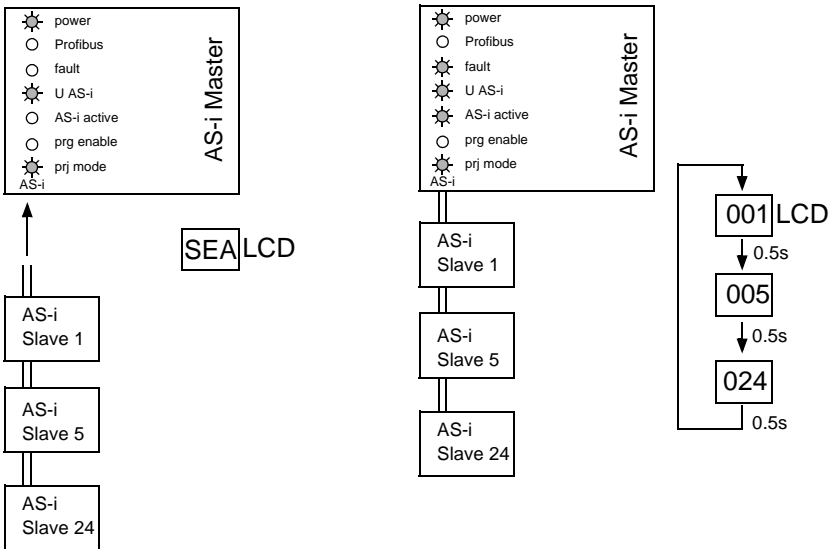
#### 13.6.4 Switching to configuration mode



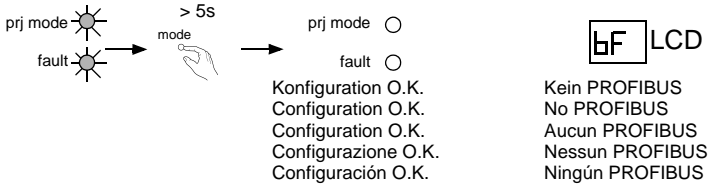
### 13.6.5 Error display (last error)



### 13.6.5.17 Connecting AS-i Slaves

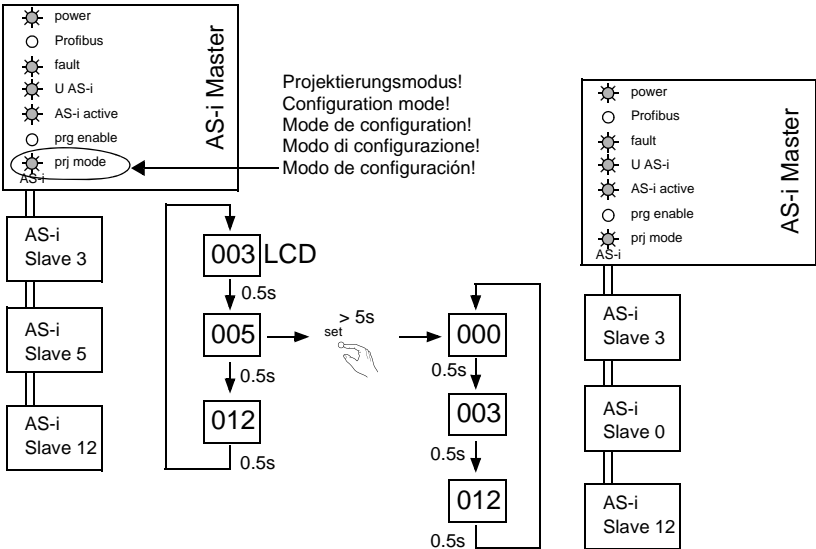


### 13.6.6 Store AS-i configuration

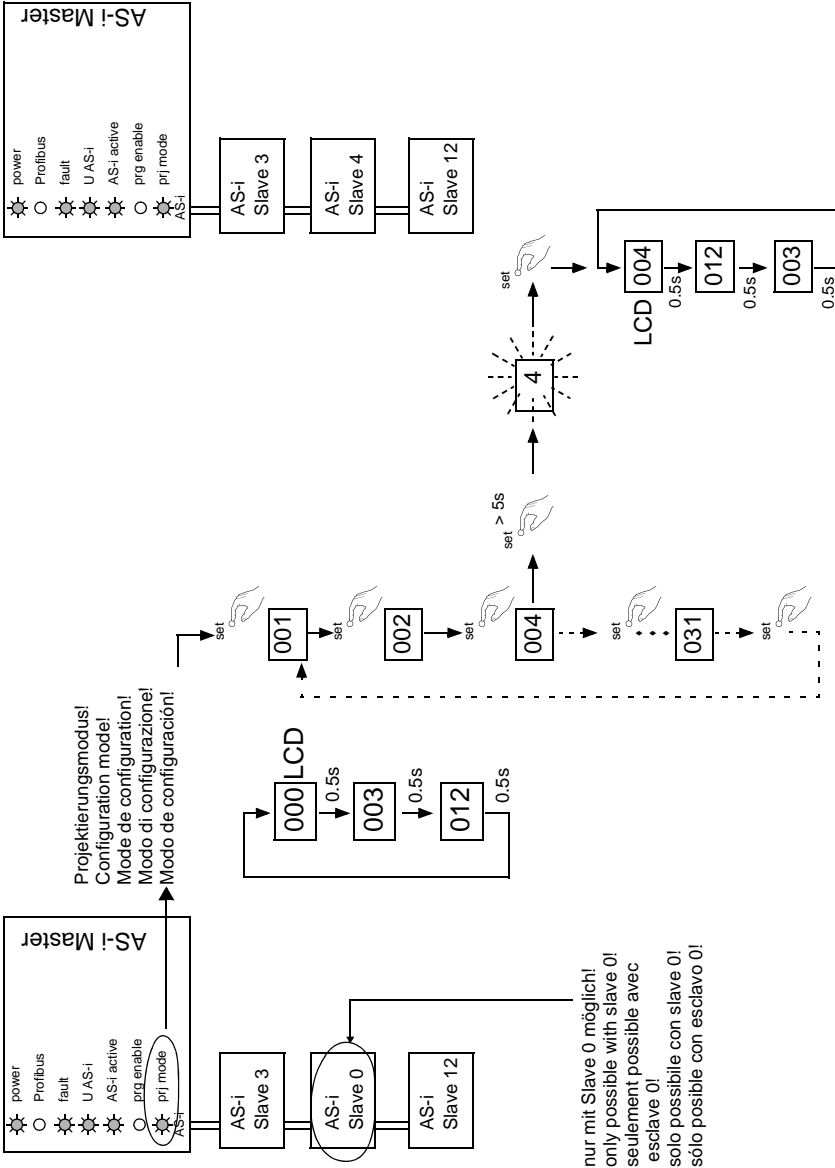


### 13.6.7 Addressing

#### 13.6.7.18 Delete slave address 5



**13.6.8 Programming slave 0 to address 4**

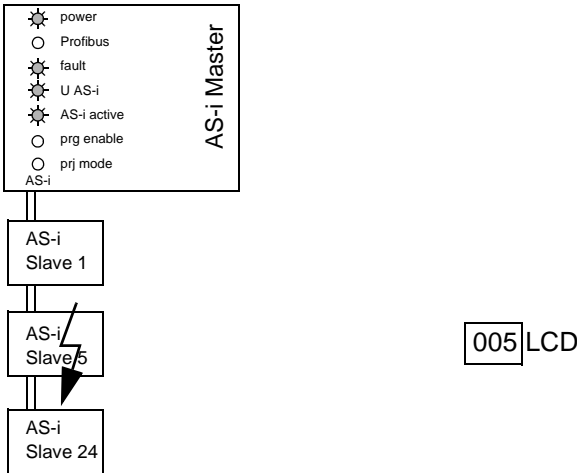


Ausgabedatum: 10.1.2008

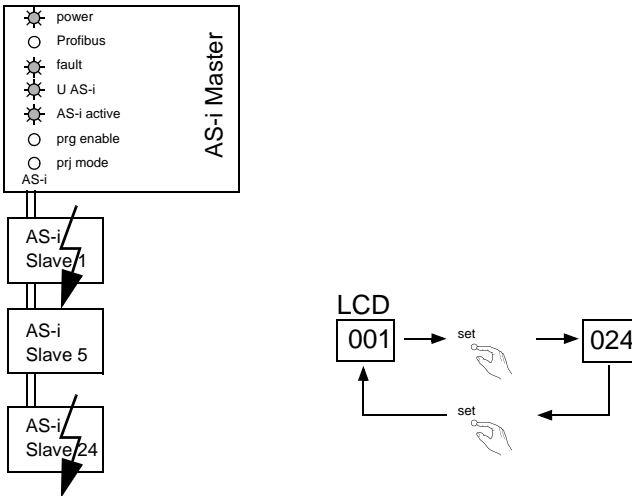


### 13.6.9 Error tracing

#### 13.6.9.19 Incorrect slaves (one error)



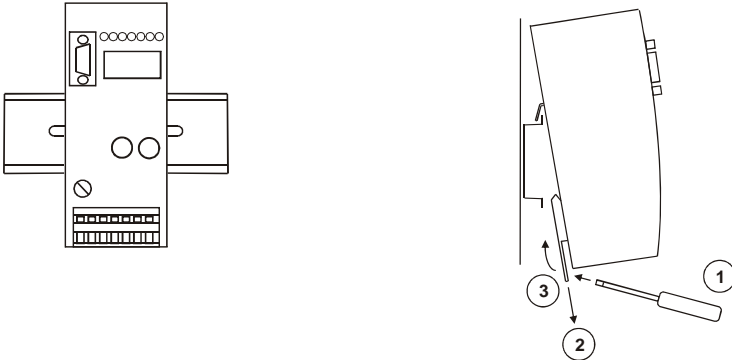
#### 13.6.9.20 Faulty slaves (multiple errors)



Ausgabedatum: 10.1.2008

### 13.6.10 Montage

- auf Montageplatte mit 35-mm-Hutschiene ①
- on mounting plate with 35 mm top-hat rail ①
- sur plaque de montage avec profilé-support 35 mm ①
- su piastra di montaggio con guida DIN 35 mm ①
- sobre placa de montaje con guía simétrica de 35 mm ①



### 13.6.11 Accssories

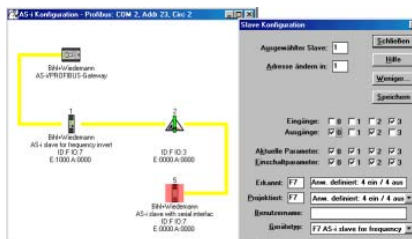
PC-Software „AS-i Control Tools“ mit seriellm Kabel zum Anschluss des AS-i Master in Edelstahl (Art.-Nr. BW1203), serieller PROFIBUS-Master (Art.-Nr. BW1258)

Software "AS-i Control Tools" with serial cable for connection of the AS-i Master in stainless steel (art. no. BW1203), serial PROFIBUS Master (art. no. BW1258)

Logiciel "AS-i Control Tools" avec câble série pour la connexion du maître AS-i en acier inox (n° art. BW1203), maître PROFIBUS série (n° art. BW1258)

Software PC "AS-i Control Tools" con cavo seriale per il collegamento del master AS-i d'acciaio inox (cod. art. BW1203), master seriale PROFIBUS (cod. art. BW1258)

Software de PC "AS-i Control Tools" (no. del art. BW1203) con cable serial para la conexión del AS-i Master en acero inoxidable (no. del art. BW1602), master PROFIBUS serial (no. del art. BW1258)



## 14 Glossary: AS-i Terms

### A/B slave

**AS-i** slave with extensible addressing: The address range of an A/B slave runs from 1A to 31A and from 1B to 31B. As the master needs the fourth output data bit for switching between A and B address, A/B slaves only have three output data bits maximum.

### Activation phase

In the activation phase the detected slaves are activated by sending the parameter. This is indicated by a "42" on the Master's Display. This phase takes only 10 ms, tops, to short to be displayed.

### AS-i power fail

Voltage drop on the AS-i line; by falling below an assigned value the master changes to the ⇒ *Off-line phase*.

### Inclusion phase

After the data exchange with all AS-i slaves the master is searching for new slaves. For this purpose a detection telegram is sent to one AS-i address and in case of an answer the master tries to read the ⇒ *actual configuration* of the slave. Depending on the mode (⇒ *protected mode* or ⇒ *configuration mode*) and on the actual configuration the detected slave will be activated.

After each data exchange with all AS-i slaves only one detection telegram is sent to one slave address. So the AS-i cycle is always one telegram longer as expected from the number of activated slaves (⇒ LAS).

### Autoprogram flags

Auto Address Enable; flag from the Host to the AS-i Master

With this flag, automatic addressing can be enabled or inhibited.

This flag is stored non-volatile in the Master.

Auto Address Assign, Auto Address Possible; flag from the AS-i Master to the Host

The automatic programming is not inhibited and there is no configuration error.

A failing slave could be addressed automatically.

Auto Address Available, flag from the AS-i Master to the Host

Exactly one AS-i slave is missing and the automatic programming is not inhibited.

If a slave with the address 0 and the profile of the missing slave is connected, it receives the address of the missing slave automatically.

### IO-Code

The first digit of the slave profile indicates the number of inputs and outputs of the slave. A 4I/4O slave e.g. is associated to "7", a slave with 4 digital Inputs to "0".

### Detection phase

In the detection phase at start-up the master is scanning for AS-i slaves. It remains in this phase until at least one slave is detected. If the master remains in the detection phase this means that no slave was found. The reason for this may be a wrong power supply or a wiring error.

The detection phase is displayed by code "41".

### Protected mode

In protected mode only those slaves are activated which are registered in the ⇒ *LPS* and whose actual configuration matches with the target configuration.

See ⇒ *configuration mode*. This mode is intended for the normal operation, since all AS-i protective measures are activated.

### ID code

The ID code is unchangeably set by the manufacturer of the AS-i slave. The AS-i Association defines the ID codes assigned to a certain category of slaves. All ⇒ *A/B slaves* e.g. possess the ID code "A".

### ID1 code, extended ID1 code

The ID1 code is specified by the manufacturer of the slave. In contrast to the other codes defining the profile this code can be modified by the master or by an addressing unit. The user should make use of this possibility only in exceptional cases, otherwise ⇒ *configuration errors* may occur.

To make the distinction between the A and the B addresses in the case of A/B slaves, the bit with the highest value of the ID1 code is used. That is why only the three lowest bits are relevant for these slaves. Since this code has been introduced with the new AS-i specification 2.1, it is also called extended ID1 code.

### ID2 code, extended ID2 code

The ID2 code is unchangeably set by the manufacturer of the slave. The AS-i Association defines the ID2 codes assigned to a certain category of slaves. All two-channel 16-bit input slaves with the profile S-7.3 possess the ID2 code "D". Since this code has been introduced with the new AS-i specification 2.1, it is also called extended ID2 code.

### Actual configuration

The configuration data of all slaves detected by the master. The configuration data of one slave, the ⇒ *slave profile*, consists of:

⇒ *IO code*, ⇒ *ID code*, ⇒ *extended ID1 code 1*, ⇒ *extended ID2 code*.

### Actual parameter

The AS-i parameter that have been sent last to the AS-i slave, in contrary to ⇒ *permanent parameters*.

### Configuration Error/Config Error

An configuration error is indicated, when target and actual configuration of the connected slaves do not match. The following cases may result in configuration errors:

Missing slave:A slave entered in the  $\Rightarrow$  *LPS* is not available

Erroneous type of slave:The  $\Rightarrow$  *slave profile* of the connected slave does not comply with the configured one.

Unknown slave:A connected slave is not entered in the  $\Rightarrow$  *LPS*.

### LAS - List of Activated Slaves

The master exchanges IO data with the slaves entered in the LAS. In the protected mode only those detected slaves ( $\Rightarrow$  *LDS*) are activated which are expected by the master and are entered in the  $\Rightarrow$  *LPS*. In the configuration mode all slaves entered in the  $\Rightarrow$  *LDS* are activated.

### LDS - List of Detected Slaves

All slaves from which the master was able to read the  $\Rightarrow$  *slave profile* are entered in the LDS.

### LPF - List of Peripheral Faults

There is a list of peripheral faults only for masters fulfilling the new specification 2.1. This list includes an entry for each slave that signals a  $\Rightarrow$  *peripheral fault*.

### LPS - List of Projected Slaves

The list of projected slaves includes all slaves expected by the master. All entries of the  $\Rightarrow$  *LDS* are taken over to the LPS by storing the actual configuration (except for a not addressed slave with the address 0).

### Offline phase

In the offline phase all input and output data is reset. This phase is entered at start-up of the master, after a  $\Rightarrow$  *AS-i power fail*, and at the transition of the  $\Rightarrow$  *configuration mode* to the  $\Rightarrow$  *protected mode*.

Furthermore the master can actively be put into the offline phase with the offline flag.

During the offline phase, masters with a display show code "40".

### Peripheral fault

A peripheral fault is shown on the master and on the slave by a red flashing LED. Depending on the slave type it is possible to visualize an overflow, an overload of the sensor's power supply or another fault regarding the peripheral equipment of the slave.

### Permanent configuration

The configuration data of all expected slaves stored in the master ( $\Rightarrow$  *slave profile*). If the permanent configuration differs from the  $\Rightarrow$  *actual configuration*, there is a configuration error.

### Permanent parameter

The parameter stored in the master that are sent to the slave after start-up of the master in the  $\Rightarrow$  *activation phase*.

### Configuration mode

During the configuration mode the master exchanges data with all connected slaves, no matter which of the slaves are projected. In this mode it is possible to commission a system without being obliged to configure it before.

See also  $\Rightarrow$  *protected mode*.

### Single slave

Compared to an  $\Rightarrow$  *A/B slave* a single slave can only be addressed from the address 1 to 31; the fourth data output bit can be used. All slaves of the older specification 2.0 are single slaves.

There are also slaves fulfilling the new specification 2.1 that are single slaves, e.g. the newer 16-bit slaves.

### Slave profile

The configuration data of a slave consisting of:

$\Rightarrow$  *IO code*,  $\Rightarrow$  *ID code*,  $\Rightarrow$  *extended ID1 code*,  $\Rightarrow$  *extended ID2 code*.

The slave profile is to differentiate between the different slave categories. It is specified by the AS-i Association and preset by the slave manufacturer.

AS-i 2.0 slaves do not have extended ID1 and ID2 codes. In this case an AS-i master 2.1 enters "F" the extended ID1 and the extended ID2 code.

## 15 Related Documents

### 15.1 Manual: "AS-i 3.0 Command Interface"

This manual contains a detailed description of the AS-i 3.0 Command Interface.

## 16 We Are Interested in Your Opinion!

Please tell us your suggestions, wishes and comments concerning this document.

We will review every note or comment and - if possible - include it in future issues.

Please fill out the form on the following page and fax it to us, or send your comments, suggestions etc. to the following address:

Bihl+Wiedemann GmbH

Technical Support

Flosswoerthstr. 41

D - 68199 Mannheim

Phone: +49 (0) 621-33 99 6-0

Fax: +49 (0) 621-33 9 22 39

eMail: [mail@bihl-wiedemann.de](mailto:mail@bihl-wiedemann.de)



**Fax-Reply**

Bihl+Wiedemann GmbH  
 Technical Support

Date: \_\_\_\_\_

Fax No: +49 (0) 621-33 9 22 39

eMail: mail@bihl-wiedemann.de

**From:**

Company: \_\_\_\_\_ Name: \_\_\_\_\_

Department: \_\_\_\_\_

Address: \_\_\_\_\_ Job Function: \_\_\_\_\_

City: \_\_\_\_\_ Phone: \_\_\_\_\_

ZIP Code: \_\_\_\_\_ Fax: \_\_\_\_\_

Country: \_\_\_\_\_ eMail: \_\_\_\_\_

**Document:**

Designation: \_\_\_\_\_ Issue Date: \_\_\_\_\_

**My Opinion of the Document**

<b>Form</b>	<b>Yes</b>	<b>In part</b>	<b>No</b>
Is the table of contents arranged clearly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the pictures/graphics easy to understand/helpful?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the written explanations of the images adequate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the quality of the images meet your expectations/needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the layout of the document allow you to find a piece of information?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>Contents</b>	<b>Yes</b>	<b>In part</b>	<b>No</b>
Is the phraseology/terminology easy to understand?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the examples practice-oriented?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the document easy to handle?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is any important information missing? If yes, what?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

\_\_\_\_\_  
 \_\_\_\_\_

**Other Comments:**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



 **Bihl**  
**+ Wiedemann**  
**...**

*Automatisierungstechnik*