

AS-i Slave for Frequency Inverters

Operating Manual



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.

© Bihl+Wiedemann GmbH
Floßwörthstr. 41
D-68199 Mannheim

Table of Contents

AS-i Slave for Frequency Inverters

	Operating Manual	1
	Table of Contents	3
	Declaration of Conformity	5
1	The Explanation of Symbols	6
1.1	Abbreviations	6
2	Safety	7
2.1	Intended use	7
2.2	General safety information	7
2.3	Waste disposal	7
3	General Information	8
3.1	Technical data	9
3.2	Dimensioned drawing	9
3.3	Devices in IP65 housing	9
3.4	Devices in IP20 housing	9
4	Front View and Connections	10
4.1	IP65 housing (BW1856, BW2038)	10
4.1.1	Socket assignment	10
4.1.1.1	Socket [1]	10
4.1.1.2	Sockets [2] and [3]	10
4.1.1.3	Socket [4]	10
4.1.2	Displays and operator interface	11
4.2	IP20 housing (BW2094)	12
4.2.1	Connections	12
4.2.2	Display and control elements	13
4.2.3	LEDs	13
4.2.3.1	Peripheral faults	13
5	First commissioning of the AS-i Slave	14
5.1	Assembly	14
5.1.1	BW1856, BW2038: on AS-i substructure module	14
5.1.2	BW2094: on mounting plate	14
5.2	Settings of the Frequency Inverter MOVIMOT	15
5.2.1	Addressing	15
5.2.1.1	BW1856, BW2038	15
5.2.1.2	BW2094	15
5.3	Connections	15
5.3.1	BW1856, BW2038	15

5.3.1.1	RS 485/24 V connection [1]	16
5.3.1.2	Connection of sensors to In 1 and In 2	16
5.3.2	BW2094	17
5.3.2.1	RS 485/24 V Anschluss	18
5.3.2.2	Connection of sensors to In 1 and In 2	18
5.4	Start-up	18
5.4.1	Troubleshooting	19
6	Different Operating Modes of the AS-i Slave	20
6.1	Cyclic operation mode AS-i Parameter Ahex	20
6.1.1	Speed value 1 settings	21
6.1.2	Ramp value settings	22
6.1.3	All speed value settings	22
6.2	Cyclic operation mode AS-i Parameter Fhex	24
6.2.1	Meaning of the AS-i input data bits	25
6.3	Switching between different operating modes	25
7	Appendix: Commissioning for SEW-Movimot	26
7.1	Commissioning the AS-i/Profibus-Gateways with the S7	26
8	Accessories	27
8.1	PROFIBUS DP Master Simulator	27
8.2	Serial PROFIBUS Master	28
8.3	Further Information	29
9	Appendix: Installation Instruction	30
9.1	List of all devices	30
9.2	BW1856 BW2038	31
9.2.1	Dimensions	31
9.2.2	Front view and connections	32
9.2.3	LED display	32
9.2.4	Assembling	33
9.2.5	Accessories	33
9.3	BW2094	34
9.3.1	Dimensions	34
9.3.2	Front view and connections	35
9.3.3	LED display	36
10	We are interested in Your Opinion!	37

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.

Article-no.	Designation
BW1856, BW2038, BW2094	AS-i Slave for Frequency Inverters

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


Datum: 01.08.05

Bernhard Wiedemann

1 The Explanation of Symbols

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

1.1 Abbreviations


AS-i	Actuator Sensor Interface
IR	infrared
In	input
nc	not connected


2 Safety

2.1 Intended use


 <p>Warning</p>	<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

 <p>Warning</p>	<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>
---	--

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

2.3 Waste disposal

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

3 General Information


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

AS-i Slave for SEW Frequency Inverters with M12 sockets in IP65	Art.-no. BW1856
AS-i Slave for SEW Frequency Inverters with M12 sockets in IP65, special wiring of the 2 inputs	Art.-nr. BW2038
AS-i Slave in IP20 for SEW Frequency Inverters	Art.-no. BW2094

The AS-i Slave for SEW Frequency Inverters enables easy data exchange and programming of frequency inverters via AS-i.

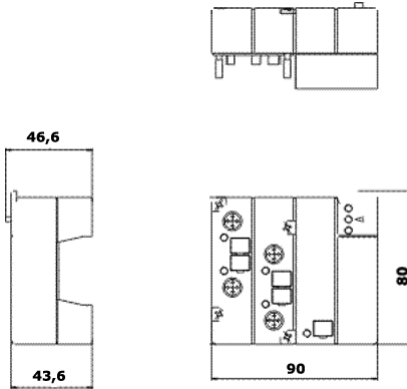
The AS-i Slave consists of an AS-i 2I Module and a serial interface to communicate with the frequency inverter. The MOVILINK protocol of MOVIMOT is implemented in the AS-i Slave. The AS-i Slave for SEW frequency inverters is software-compatible to previous AS-i Slaves for SEW Frequency Inverters.

3.1 Technical data

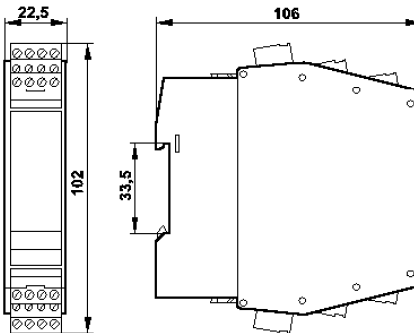
 Note	<p>The technical data of AS-i Slave for Frquency Inverters are placed in the data sheet. Please see the current version on the web page: http://www.bihl-wiedemann.de/englisch/index.html</p>
--	---

3.2 Dimensioned drawing

3.3 Devices in IP65 housing




3.4 Devices in IP20 housing

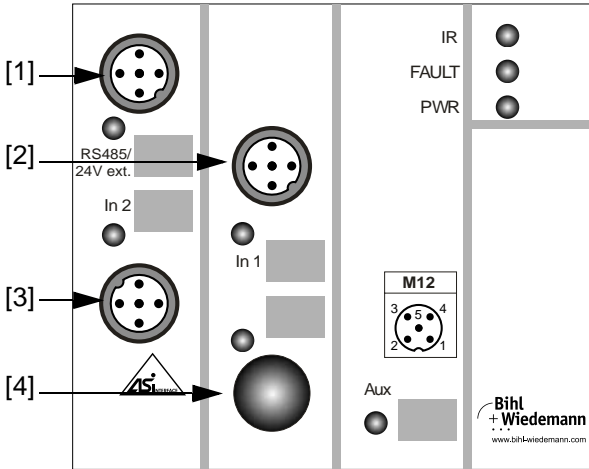


4 Front View and Connections

4.1 IP65 housing (BW1856, BW2038)

 Note	BW1856 and BW2038 are similarly constructed except special wiring of the 2 inputs.
--	--

4.1.1 Socket assignment



4.1.1.1 Socket [1]

Pin	BW1856+BW2038
1	24 V ext.
2	RS 485 TX -
3	0 V ext.
4	RS 485 TX +
5	FE

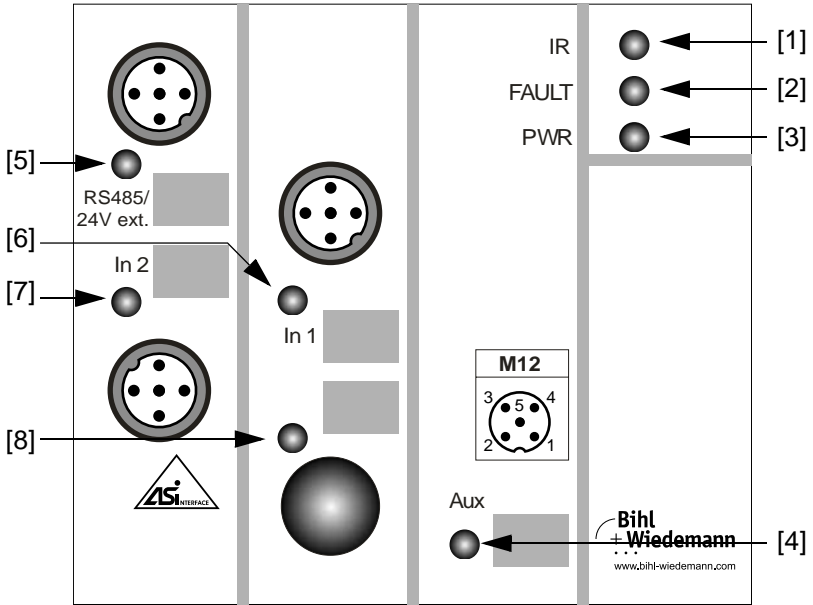
4.1.1.2 Sockets [2] and [3]

Pin	BW1856	BW2038
1	24 V+ (AS-i)	
2	In	nc (not connected)
3	0 V (AS-i)	
4	In	
5	nc (not connected)	

4.1.1.3 Socket [4]

not used

4.1.2 Displays and operator interface



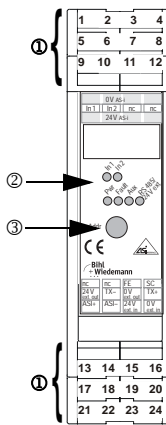
- [1] Infrared interface
- [2] LED *Fault* - error
- [3] LED *Pwr* - AS-i voltage ON
- [4] LED *Aux* - 24 V power supply ON

- [5] LED 24V/RS485
- RS 485 communication active
- [6] LED *In 1* - state of channel 1
- [7] LED *In 2* - state of channel 2
- [8] not connected

4.2 IP20 housing (BW2094)

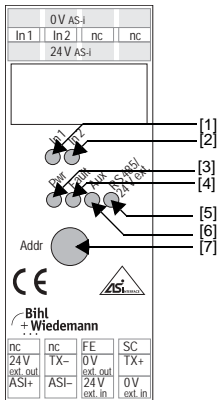
4.2.1 Connections

	Connection
1	0 V (AS-i)
2	
3	
4	
5	In 1
6	In 2
7	nc
8	nc
9	24 V (AS-i)
10	
11	
12	
13	nc
14	nc
15	FE (earth)
16	SC (screen)
17	24 V (ext out)
18	TX-
19	0 V (ext out)
20	TX+
21	ASI+
22	ASI-
23	24 V (ext. in)
24	0 V (ext in)



①	Combicon connection
②	LED status display
③	addressing jack

4.2.2 Display and control elements



- | | | | |
|-----|------------------------------------|-----|---------------------------------|
| [1] | LED <i>In 1</i> - status channel 1 | [5] | LED <i>Aux</i> - 24 V supply ON |
| [2] | LED <i>In 2</i> - status channel 2 | [6] | LED <i>24V/RS485</i> |
| [3] | LED <i>Pwr</i> - AS-i voltage ON | | - RS 485 communication active |
| [4] | LED <i>Fault</i> - Fault | [7] | <i>Addr</i> - addressing jack |

4.2.3 LEDs


4.2.3.1 Peripheral faults


The AS-i Slave for Frequency Inverters can release a peripheral fault in the following cases:

- error in the frequency inverter
- communication error to the frequency inverter
- short circuit at the sensor's supply

Peripheral faults are signaled by a flashing Fault LED.


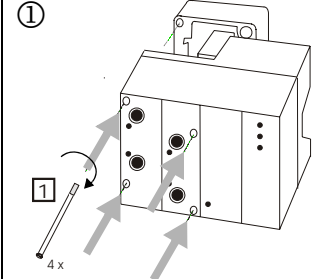
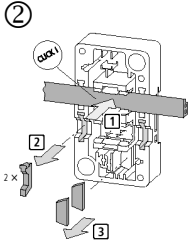
5 First commissioning of the AS-i Slave

 Warning	<ul style="list-style-type: none"> • Make sure before the start-up that no danger for the plant can result, into which the equipment is merged, e.g. from uncontrolled headed for processes. • Examine before start-up again all connections for their correctness.
--	---

 Attention	<ul style="list-style-type: none"> • Before commissioning make yourselves familiar with communication between your AS-i Master and the AS-i Slave for Frequency Inverter. • Commissioning requires exact knowledge of AS-i and the programming of your master equipment.
--	--

5.1 Assembly

5.1.1 BW1856, BW2038: on AS-i substructure module

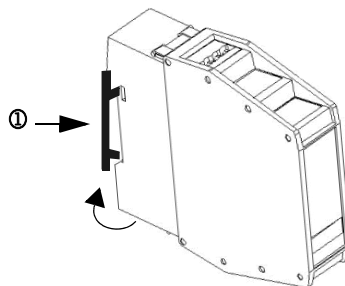
 Attention			<p>auf AS-i-Unterteil on AS-i substructure module sur embase AS-i su base AS-i en módulo base AS-i</p>
--	---	---	--

The AS-i Slave is mounted on the substructure module for the connection via AS-i as well as the separate 24 V.

There are substructure modules for connecting AS-i flat cables and flat cable for the separate 24 V as well as substructure modules with AS-i round cables for the separate 24 V.

5.1.2 BW2094: on mounting plate

on mounting plate
with 35-mm top hat rail[Ⓞ]



Issue date - 31.10.2007

5.2 Settings of the Frequency Inverter MOVIMOT

Before commissioning the following settings must be made on the MOVIMOT:

1. Adjust the bus address 1 via the DIP-switch
2. Adjust the maximum frequency at the potentiometer
3. Adjust the ramp at the appropriate potentiometer

5.2.1 Addressing

5.2.1.1 BW1856, BW2038

The addressing of the slaves can be made via:

- Infrared interface (IR)
- AS-i by using a hand held device or the AS-i Master. Addresses can be set from 1 to 31.

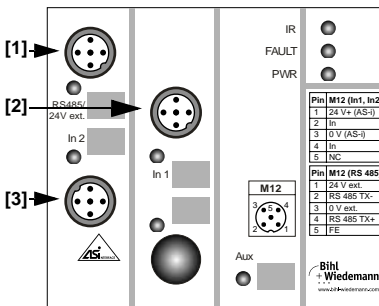
5.2.1.2 BW2094

The addressing of the slaves can be made via:

- using the addressing jack on the front wall of the BW2094
- AS-i by using a hand held device or the AS-i Master. Addresses can be set from 1 to 31.

5.3 Connections

5.3.1 BW1856, BW2038



[1] RS 485/24 V connection

[2] connection In 2

[3] connection In 1

It is possible to attach 2 sensors directly to the AS-i Slave for Frequency Inverters in IP65. Separate 24 V for the supply of the MOVIMOT electronic is looped in.


5.3.1.1 RS 485/24 V connection [1]

- Connect the serial interface cable and 24 V ext. according to the assignment in the table:

Pin	connection [1]
1	24 V ext.
2	RS 485 TX -
3	0 V ext.
4	RS 485 TX +
5	FE

The tap of the external 24 V is protected by a resetting fuse. Please take care, that no short-circuit occurs between external 24 V and external 0 V. For EMC reasons use a protected cable. The shield is connected on the clamp 5 and correspondingly on the frequency inverter. The max. length of the serial interface cable between the AS-i Slave and frequency inverter is 3 m.

5.3.1.2 Connection of sensors to In 1 and In 2

 Note	<p>BW1856 and BW2038 are similarly constructed except special wiring of the 2 inputs.</p>
--	---

Connect the sensors according to the assignment in the table:

Connection [2] In 1


Pin	BW1856	BW2038
1	24 V+ (AS-i)	
2	In 1	nc (not connected)
3	0 V (AS-i)	
4	In 1	
5	nc (not connected)	

Connection [3] In 2

Pin	BW1856	BW2038
1	24 V+ (AS-i)	
2	In 2	nc (not connected)
3	0 V (AS-i)	
4	In 2	
5	nc (not connected)	

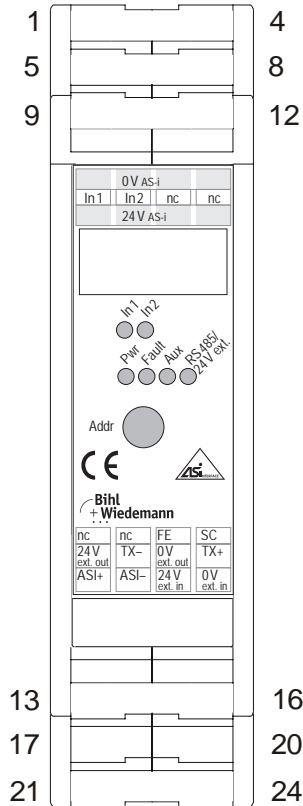
2-wire sensors are connected to pin 1 (24 V+ (AS-i) and pin 2 (In1/In 2) and/or 1 (24 V+ AS-i) and 4 (In 1/In 2) of the M12 connector.

3-wire sensors are connected to pin 1 (24 V+ AS-i), 2 (In 1/In 2), 3 (0 V AS-i) and/or 1 (24 V+ AS-i), 4 (In 1/In 2), 3 (0 V AS-i).

 Note	<p>In case of BW1856 pin 2 and pin 4 are internally connected.</p>
--	--

5.3.2 BW2094

1	
2	0 V (AS-i)
3	
4	
5	In 1
6	In 2
7	nc
8	nc
9	24 V (AS-i)
10	
11	
12	
13	nc
14	nc
15	FE
16	SC
17	24 V (ext out)
18	TX-
19	0 V (ext out)
20	TX+
21	ASI+
22	ASI-
23	24 V (ext. in)
24	0 V (ext in)



It is possible to attach 2 sensors directly to the AS-i Slave for Frequency Inverters. Separate 24 V for the supply of the MOVIMOT electronic is looped in. The sensors supply is made by AS-i.

5.3.2.1 RS 485/24 V Anschluss

Connect the serial interface cable and 24 V ext. according to the assignment in the table <chapter 5.3.2 "BW2094", page 17>.

The tap of the external 24 V is protected by a resetting fuse. Please take care, that no short-circuit occurs between external 24 V and external 0 V.

For EMC reasons use a protected cable. The shield is connected accordingly the terminal assignment.

The max. length of the serial interface cable between the AS-i Slave and frequency inverter is 3 m.

5.3.2.2 Connection of sensors to In 1 and In 2

Connect the sensors according to the assignment on the label.

2-wire sensors:

- via **24 V (out of AS-i)** and **In1/In 2**

3-wire sensors:

- via **24 V (out of AS-i)** **In 1/In 2** and **0 V (out of AS-i)**

5.4 Start-up

After addressing and wiring the AS-i Slave it can be put into operation.

- Switch AS-i network and the frequency inverter on.

The green *Pwr* LED at the Slave and the communication LED RS 485/24 V should light.


The red *Fault* LED should be off.

Preconditioned that a "start" parameter is sent to the AS-i slave, the frequency inverter (see chapter 6.1) can be operated in the cyclical operation mode now.

5.4.1 Troubleshooting

LED	Status	procedure
PWR LED	○	check the AS-i connection
RS 485/24 V LED	○	check if the Frequency Inverter is on
Fault LED	☀	<ul style="list-style-type: none"> • check wiring between Frequency Inverter and Slave • check the values of the parameters
<u>and</u> RS 485/24 V LED	○	<ul style="list-style-type: none"> or • peripheral fault is pending¹
RS 485/24 V LED	○	No AS-i communication <ul style="list-style-type: none"> • was the AS-i Slave addressed in a range between 1 und 31 before start-up? • Is the AS-i Master in normal operation?

1.As-i Slave for Frequency Inverters can release a peripheral fault in following cases:
 - error in the Frequency Inverter
 - error in the communication between the AS-i Slave and Frequency Inverter
 - short-circuit at the sensor's supply

 Note	<p>If the slave does not behave as described in the cyclic operation mode (see chapter 6), please check if the switching-on parameters was sent to the AS-i slave during the initialization of AS-i.</p>
--	--

6 Different Operating Modes of the AS-i Slave

The function of the AS-i Slave for Frequency Inverters is to drive frequency inverters via AS-i directly. The user does not notice the serial communication between the slave and the frequency inverter.

The control of the frequency inverter occurs via the AS-i process data. That means that in every AS-i cycle the control and/or the AS-i Master exchanges the I/O-data with the slave.

Additionally it is possible through sending of specific AS-i parameter values, to change between different operating states of the AS-i slave.

6.1 Cyclic operation mode AS-i Parameter A_{hex}

Cyclic operation mode with the parameter A: operating with default speed via AS-i.

Output data	meaning	predefined value after Power-On-Reset
0 0000	stop	
1 0001	speed 1	0x099A (15.0%)
2 0010	speed 2	0xF666 (-15.0%)
3 0011	speed 3	0x0CCD (20.0%)
4 0100	speed 4	0xF333 (-20.0%)
5 0101	speed 5	0x1000 (25.0%)
6 0110	speed 6	0xF000 (-25.0%)
7 0111	speed 7	0x1555 (33.0%)
8 1000	speed 8	0xEAAB (-33.0%)
9 1001	speed 9	0x2000 (50.0%)
A 1010	speed 10	0xE000 (-50.0%)
B 1011	speed 11	0x3000 (75.0%)
C 1100	speed 12	0xD000 (-75.0%)
D 1101	speed 13	0x4000 (100.0%)
E 1110	speed 14	0xC000 (-100.0%)
F 1111	reset	

Predefined ramp after Power-On-Reset: 0x0000 (0s = not used). For the meaning of the input data see the following table.

Input data	meaning
Bit 0 ---x	motor turns
Bit 1 --x-	error
Bit 2 -x--	input 1
Bit 3 x---	input 2

6.1.1 Speed value 1 settings



Attention

The motor cannot be stopped while this command is being executed. The outputs to the slave are not transmitted. It is recommended to execute this command when the motor is already stopped.

Request (data from the PLC to AS-i Master)	
Byte 1	7D _{hex} (command)
Byte 2	00 _{hex} (T, circuit)
Byte 3	0B _{hex} (command, part 2)
Byte 4	01 _{hex} (slave address)
Byte 5	0A _{hex} (AS-i parameter for the next cyclic operation)
Byte 6	00 _{hex} (channel 0 = speed set point 1)
Byte 7	xx _{hex} (speed high byte)
Byte 8	xx _{hex} (speed low byte)



Attention

Respect minimum speed!

The command is executed after setting the Toggle-bit (T = bit 7 in byte 2).

Response (data from the PLC to AS-i Master with Toggle-bit set)	
Byte 1	7D _{hex}
Byte 2	Status (0 o.k., otherwise error, see following chart)

If the command has to be executed again you have to reset/set the toggle bit.

The same applies also to the speed set points 2 - 14. The byte 6 has to be changed to the values 1 - 12 in this case.

With the channels 0 – 13 the speed set points 1 - 14 can be changed. With channel 14 you transmit the ramp and channel 15 is reserved.

While this command is executed all the input data of the gateway are frozen and are going to be released after the slave has accepted the parameter for the cyclic operation.

While this command is executed the AS-i/Profibus Gateway transmits the frozen input values until new values are transmitted. At no point wrong sensor data are transmitted.

The execution of this command can take up to 100 milliseconds.

6.1.2 Ramp value settings



Attention

The motor cannot be stopped while this command is executed. The outputs to the slave are not transmitted. It is recommended to execute this command after the motor was stopped already.

Request (data from the PLC to AS-i Master)	
Byte 1	7D _{hex} (command)
Byte 2	00 _{hex} (T, circuit)
Byte 3	0B _{hex} (command, part 2)
Byte 4	01 _{hex} (Slave address)
Byte 5	0A _{hex} (AS-i parameter for the next cyclic operation)
Byte 6	0E _{hex} (channel 14 = ramp)
Byte 7	xx _{hex} (ramp high byte)
Byte 8	xx _{hex} (ramp low byte)

The command is executed after setting the Toggle-bit (T = bit 7 in byte 2).

Response (data from the SPS to AS-i Master (the Toggle-bit is set))	
Byte 1	7D _{hex}
Byte 2	status (0: o.k., not error, see following chart)

If the command has to be executed again you have to reset/set the toggle bit. While this command is executed all the input data of the gateway are frozen and are going to be released after the slave has accepted the parameter for the cyclic operation. While this command is executed the AS-i/Profibus Gateway transmits the frozen input values until new values are transmitted. At no point wrong sensor data are transmitted.

The execution of this command can take up to 100 milliseconds.

6.1.3 All speed value settings



Attention

The motor cannot be stopped while this command is being executed. The outputs to the slave are not transmitted. It is recommended to execute this command when the motor is already stopped.

Request (data from the PLC to AS-i Master)	
Byte 1	7D _{hex} (command)
Byte 2	00 _{hex} (Toggle-bit/AS-i circuit)
Byte 3	0A _{hex} (command, part 2)
Byte 4	01 _{hex} (Slave address)
Byte 5	0A _{hex} (AS-i parameter for the next cyclic operation)
Byte 6	speed 1, high byte
Byte 7	speed 1, low byte
Byte 8	speed 2, high byte
Byte 9	speed 2, low byte
Byte 10	speed 3, high byte
Byte 11	speed 3, low byte
Byte 12	speed 4, high byte
Byte 13	speed 4, low byte
Byte 14	speed 5, high byte
Byte 15	speed 5, low byte
Byte 16	speed 6, high byte
Byte 17	speed 6, low byte
Byte 18	speed 7, high byte
Byte 19	speed 7, low byte
Byte 20	speed 8, high byte
Byte 21	speed 8, low byte
Byte 22	speed 9, high byte
Byte 23	speed 9, low byte
Byte 24	speed 10, high byte
Byte 25	speed 10, low byte
Byte 26	speed 11, high byte
Byte 27	speed 11, low byte
Byte 28	speed 12, high byte
Byte 29	speed 12, low byte
Byte 30	speed 13, high byte
Byte 31	speed 13, low byte
Byte 32	speed 14, high byte
Byte 33	speed 14, low byte

The command is executed after setting the Toggle-bit (T = bit 7 in byte 2).

Response (data from the PLC to AS-i Master with Toggle-bit set)	
Byte 1	7D _{hex}
Byte 2	Status (0: o.k., if not error, see following chart)

If the command has to be executed again you have to reset/set the toggle bit. While this command is executed all the input data of the gateway are frozen and are going to be released after the slave has accepted the parameter for the cyclic operation. While this command is executed the AS-i/Profibus Gateway transmits the frozen input values until new values are transmitted. At no point wrong sensor data are transmitted.

The execution of this command can take up to 1 second.

Errors (result in byte 2 from response): The bit number 7 from byte 2 represents the Toggle-bit (for example 80_{hex} represents a no error execution with the Toggle bit set).

Value	meaning
00 _{hex}	error-free execution
11 _{hex}	general error
12 _{hex}	command value not allowed
13 _{hex}	command interface length in I/O data field or length from the DPV1-requests is too short
14 _{hex}	no access rights
21 _{hex}	general error

After this commands the slave is in operation mode 'A'. The different speed set points that were set can be selected by using the output data. The speeds are represented as multiple values from 0.0061%, as a number with sign (as complement 2 representation, that is 0xFFFF represents -1 or -0,0061%) The ramp represents the time for the acceleration from 0 through 50 Hz in milliseconds. It has to be a value between 100 ms and 10s, or, when the slave is not intended to transmit a ramp to the frequency inverter, the value 0.

6.2 Cyclic operation mode AS-i Parameter F_{hex}

In the cyclic operation mode with AS-i parameter F_{hex} the frequency inverter operates via the AS-i output data bits as a conventional 4I/4O module. The 4 AS-i output data bits are assigned fixed processes.

Meaning of the 4 AS-i output data bits:

0 = logical 0, 1 = logical 1, X = arbitrary

bit 3	bit 2	bit 1	bit 0	function
X	X	X	0	clockwise rotation
X	X	X	1	counterclockwise rotation
0	0	0	0	reset
0	0	0	1	Stop
0	0	1	X	fixed reference value (15%)
0	1	0	X	fixed reference value (20%)
0	1	1	X	fixed reference value (25%)
1	0	0	X	fixed reference value (33%)
1	0	1	X	fixed reference value (50%)
1	1	0	X	fixed reference value (100%)
1	1	1	1	Stop

The max. frequency (100%) will be set at the MOVIMOT potentiometer.

Checkback signals from the frequency inverter will be transferred to the AS-i Master or the control via the 4 AS-i input data bits. The following table explains the bit combination in which the checkback signal is displayed.

6.2.1 Meaning of the AS-i input data bits

bit 3	bit 2	bit 1	bit 0	function
X	X	X	0	not ready for operation
X	X	X	1	ready for operation
0	0	0	X/0	system error
0	0	1	X/0	FC ¹ not ready
0	1	0	X/1	FC enabled/disbled
0	1	1	X/1	FC ready/released
1	0	0	X/0	overvoltage
1	0	1	X/0	overload output stage
1	1	0	X/0	overload motor
1	1	1	X/0	overload brake coil

1. Frequency converter

In the cyclical operation the bus time out control is activated if one of the fixed reference values is selected and deactivated if one of the bit combinations is selected for *stop* or *handshake*.


6.3 Switching between different operating modes

You can switch the single modes of operation via an AS-i parameter call. In the controller program a call instruction "write AS-i parameter value" must be made. The slave address and the parameter value is handed over to this controller program.


However, it must be noticed that the meaning of the the AS-i input data bits changes.

7 Appendix: Commissioning for SEW-Movimot

7.1 Commissioning the AS-i/Profibus-Gateways with the S7

 Note	<p>You can also commission it, without the S7, by using the Bihl+Wiedemann Profibus Mastersimulator (see chapter 8.1).</p>
--	--

- Put the AS-i/Profibus Gateway into operation with the S7.
- In the GSD file select the 32Byte digital I/O data and a 34 byte mailbox interface.
- The AS-i Power ON Parameters for the SEW Slaves have to be set to A_{hex} (see chapter 6.1) or F_{hex} (see chapter 6.2).


 Attention	<p>If the AS-i Power On parameters for the AS-i Slaves for Movimot in the GSD file are not set to proper parameter, in some situations the slave could give out a wrong speed.</p>
--	--

- The SEW Movimot Slaves start in the selected operating mode now.

8 Accessories

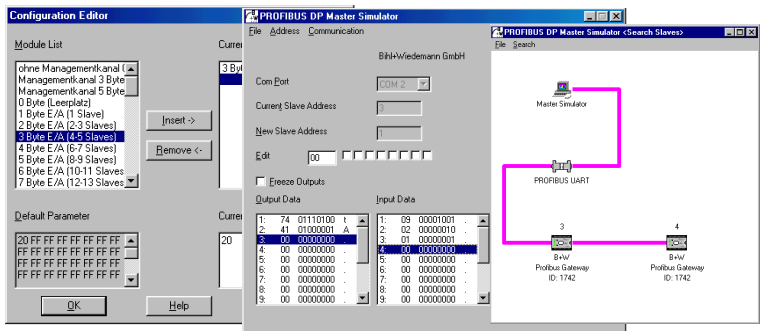
8.1 PROFIBUS DP Master Simulator

The PROFIBUS DP Master Simulator is an easy to use software for data exchange with PROFIBUS slaves of almost all manufacturers via PROFIBUS DP.

housing	device	art.-no.	attribute
	Profibus-DP-Master Simulator	BW1257	universal tool for the data transfer with PROFIBUS-Slaves 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 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 (article no. BW1257) 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.

8.2 Serial PROFIBUS Master

housing	device	art.-no.	attribute
	Serial PROFIBUS Master	BW1258	tool for the data transfer and process control of PROFIBUS-DP Slaves

The serial PROFIBUS DP Master is an easy to use software for data exchange with PROFIBUS slaves of many suppliers via PROFIBUS DP. It can be processed in two modes:

1. Commissioning and test tool for PROFIBUS DP Slaves via PROFIBUS DP V0

In this operation mode I/O data can be exchanged cyclically with PROFIBUS slaves via PROFIBUS DP V0 Input data can be read and output data can be written. Furthermore the serial PROFIBUS DP Master also processes GSD-files. User parameters can be edited and the configuration can be modified and stored. The PROFIBUS station address can be changed as well with the serial PROFIBUS DP Master. This is useful for PROFIBUS I/O modules in protection class IP67 without addressing switches.

The serial PROFIBUS DP Master offers the possibility to scan a PROFIBUS network for connected slaves and display them in a graphical way. In this case the serial 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 single bit mode it is possible to set an output as long as the mouse button is pressed.

Beside the monitoring and commissioning software, DLL drivers as well as examples written in C are available for download on the homepage. This offers the possibility to use the PROFIBUS UART in an application in combination with an own software.

2. PROFIBUS Master class 2 with PROFIBUS DP V1 functionality

In this mode the serial PROFIBUS Master works as a class 2 Master in combination with the class 1 Master in a PROFIBUS network. Complex devices e. g. drives, modular I/O systems even PROFIBUS PA devices can be commissioned on-line via PROFIBUS DP V1. PROFIBUS PA devices need an additional segment coupler.

8.3 Further Information

For further information please visit the homepage of Bihl+Wiedemann:

<http://www.bihl-wiedemann.com>

9 Appendix: Installation Instruction

9.1 List of all devices



Note

Please view the **chapter 3, “General Information,” on page 8** for the list of all devices described in this installation instruction.

9.2

BW1856
BW2038

AS-i-Slave für Frequenzumrichter
AS-i Slave for Frequency Inverters
Esclave AS-i pour variateur de fréquence
Slave AS-i per convertitore di frequenza
Esclavo AS-i para variador de frecuencia

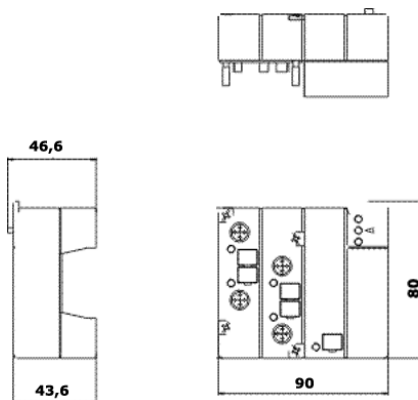


Dokumentation AS-i-Slave für Frequenzumrichter (deutsch)
 Documentation AS-i Slave for Frequency Inverters (english)

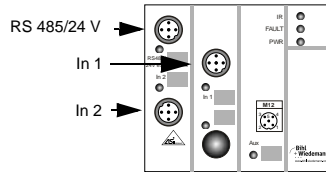


Die Geräte dürfen nur von Fachpersonal aufgebaut, angeschlossen und in Betrieb genommen werden! / Only qualified staff is allowed to mount, connect and set up the modules! / Les modules ne doivent être montés, raccordés et mis en service que par du personnel qualifié! / Gli apparecchi possono essere 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!

9.2.1 Dimensions



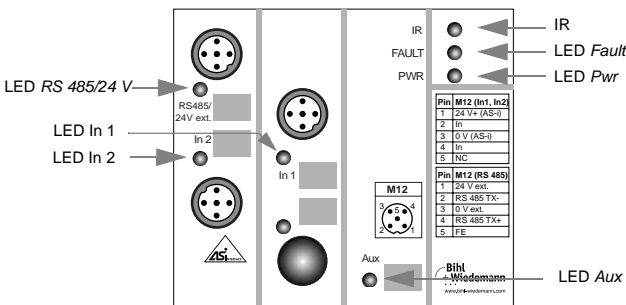
9.2.2 Front view and connections



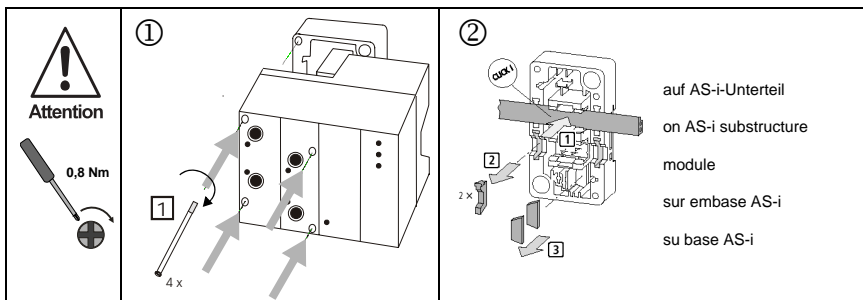
Pin	BW1856+BW2038	BW1856	BW2038	BW1856	BW2038
	RS 485/24 V	In 1		In 2	
1	24 V ext.	24 V+ (AS-i)		24 V+ (AS-i)	
2	RS 485 TX -	In 1	nc	In 2	nc
3	0 V ext.	0 V (AS-i)		0 V (AS-i)	
4	RS 485 TX +	In 1		In 2	
5	FE	nc		nc	

9.2.3 LED display

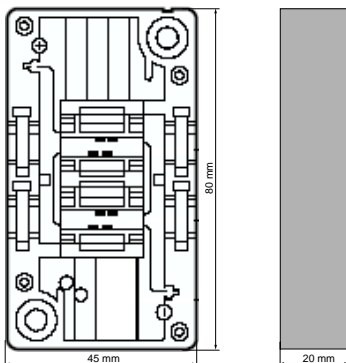
LED	Color	Status	Description
Pwr	grün/green / vert/verde / verde		Spannung an den AS-i-Klemmen / Voltage at the AS-i clamps / Tension aux bornes AS-i / Tensione ai morsetti AS-i / Voltaje en conectores AS-i
Fault	rot/red/ rouge/rosso/ rojo		AS-i-Kommunikationsfehler / AS-i communication error / Erreur de communication AS-i / Errore di comunicazione AS-i / Error de la comunicación AS-i
			Peripheriefehler / Periphery error / Erreur périphérique / Errore di periferica / Error de la periferia
aux	grün/green/ vert/verde/ verde		Externe Versorgungsspannung 24 V liegt an / Extern supply voltage 24 V fits/ Tension d'alimentation externe 24 V présente/ Tensione di alimentazione esterna 24 V presente / Fuente de voltaje externa 24 V presente
In 1 In 2	gelb/yellow/ jaune/giallo/ amarillo		Kein Signal/ No signal / Pas de signal / Nessun segnale / Ninguna señal
			Analoges Signal im Wertebereich / Analog signal in the range of values / Signal analogique dans la gamme de valeurs / Segnale analogico nella gamma di valori / Señal analógica dentro del rango de valores
			Analoges Signal außerhalb des Wertebereichs / Analog signal out of the range of values / Signal analogique hors de la gamme de valeurs / Segnale analogico fuori la gamma dei valori / Señal analógica fuera del rango de valores



9.2.4 Assembling



9.2.5 Accessories



- BW1181**

AS-i-Unterteil zum Anschluss von 1 AS-i-Flachkabel, 1 Flachkabel für externe Energieversorgung / AS-i substructure module to connect 1 AS-i flat cable, 1 flat cable for additional supply / Embase AS-i pour le raccordement de 1 câble plat AS-i et 1 câble plat pour l'alimentation externe / Base AS-i per il collegamento di 1 cavo piatto e 1 cavo piatto per l'alimentazione esterna / Base AS-i para la conexión de 1 cable plano y 1 cable plano para la fuente adicional
- BW1183**

AS-i-Unterteil zum Anschluss von 1 AS-i-Rundkabel, 1 Rundkabel für externe Energieversorgung / AS-i substructure module to connect 1 AS-i round cable, 1 round cable for additional supply / Embase AS-i pour le raccordement de 1 câble rond AS-i, 1 câble rond pour l'alimentation externe / Base AS-i per il collegamento di 1 cavo rotondo e un cavo rotondo per l'alimentazione esterna / Base AS-i para la conexión de 1 cable redondo y 1 cable redondo para la fuente adicional
- BW1257**

Profibus DP Mastersimulator / Profibus DP Master Simulator / Simulateur maître PROFIBUS / Simulatore di master PROFIBUS DP / Simulatore di master PROFIBUS DP / Simulador de Maestro Profibus

9.3 BW2094

AS-i-Slave in IP20 für SEW Frequenzumrichter
 AS-i Slave in IP20 for SEW Frequency Inverters
 Esclave AS-i pour variateur de fréquence
 Slave AS-i per convertitore di frequenza
 Esclavo AS-i para variador de frecuencia



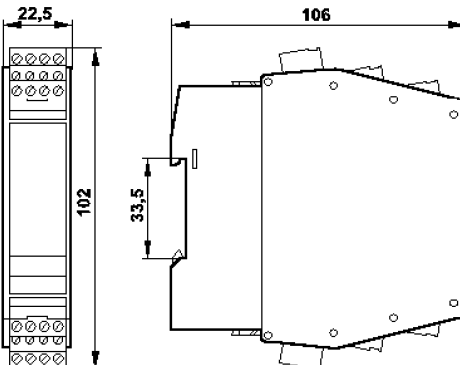
Dokumentation (deutsch): <http://www.bihl-wiedemann.de>
 Documentation (english): <http://www.bihl-wiedemann.com>



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!

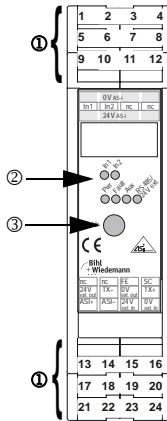
9.3.1 Dimensions



Ausgabedatum: 31.10.2007

9.3.2 Front view and connections

	Connections
1	0 V AS-i
2	
3	
4	
5	In 1
6	In 2
7	nc
8	nc
9	24 V AS-i
10	
11	
12	
13	nc
14	nc
15	FE
16	SC
17	24 V (ext out)
18	TX-
19	0 V (ext out)
20	TX+
21	ASI+
22	ASI-
23	24 V (ext. in)
24	0 V (ext in)



①	Combicon Anschlüsse
②	LED-Statusanzeige
③	Adressierbuchse

①	Combicon connections
②	LED status display
③	Addressing socket








①	Combicon raccordement
②	Afficheur d'état LED
③	Douille de programmation

①	Combicon collegamento
②	Visualizzazione a LED
③	Zoccolo di programmazione

①	Combicon conexión
②	LED visualización
③	Zócalo de programación

- Tightening torque: 0,5 Nm
- Conductor cross section: AWG/kcmil min 28/max 12

9.3.3 LED display

LED	Color	Status	Description
Pwr	grün/green / vert/verde / verde		Spannung an den AS-i-Klemmen / Voltage at the AS-i clamps / Tension aux bornes AS-i / Tensione ai morsetti AS-i / Voltaje en conectores AS-i
Fault	rot/red/ rouge/rosso/ rojo		AS-i-Kommunikationsfehler / AS-i communication error/ Erreur de communication AS-i / Errore di comunicazione AS-i / Error de la comunicación AS-i
			Peripheriefehler / Periphery error / Erreur périphérique / Errore di periferica / Error de la periferia
aux	grün/green/ vert/verde/ verde		Externe Versorgungsspannung 24 V liegt an / Extern supply voltage 24 V fits/ Tension d'alimentation externe 24 V présente/ Tensione di alimentazione esterna 24 V presente / Fuente de voltaje externa 24 V presente
In 1 In 2	gelb/yellow/ jaune/giallo/ amarillo		Kein Signal/ No signal / Pas de signal / Nessun segnale / Ninguna señal
			Analoges Signal im Wertebereich / Analog signal in the range of values / Signal analogique dans la gamme de valeurs / Segnale analogico nella gamma di valori / Señal analógica dentro del rango de valores
			Analoges Signal außerhalb des Wertebereichs / Analog signal out of the range of values / Signal analogique hors de la gamme de valeurs / Segnale analogico fuori la gamma dei valori / Señal analógica fuera del rango de valores

10 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

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 about the operating manual

Form	Yes	In part	No
Is the table of contents arranged clearly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are the pictures/graphics helpful/easy to understand?	<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"/>

Contents	Yes	In part	No
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:

Issue date - 31.10.2007