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Subject to change without prior notice

Translation
of the original operating instructions

BWU2797

ASi-3 EtherCAT Gateway with integr. Safety Monitor

1 Master, Power 24V, 6 safe outputs, Safe Link, ethernet diagnostic interface

Notes on using these connection and operating instructions

These connection and operating instructions contain information regarding the proper and effective use of the device.

See the manuals "ASi-3 EtherCAT Gateway with integr. Safety Monitor" and "ASI-MON360/ASi Control Tools360" for detailed information.

Safety precautions and warnings are designated by the ⚠ symbol.

Bihl+Wiedemann GmbH is not liable for damage resulting from improper use of its equipment. Familiarity with these instructions constitutes part of the knowledge required for proper use.

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This operating instruction is a part of the scope of delivery.

Specified normal operation

The „ASi-3 EtherCAT Gateway with integr. Safety Monitor" is a combination of a gateway with a safety monitor.

The device has been designed as a disconnecting protective device for safeguarding danger zones on power-driven work equipment by applying the power to lock principle. Thereby these outputs are only usable, if the safe state can be achieved by switching off the power.

The device is approved for safety applications up to Category 4 / PL e / SIL 3.

The device may only be operated within the limits of its technical specifications. It may only be operated with the specifiedcurrent and voltage values.

Error states of the remote outputs used in the safe configuration can be eliminated by starting and stopping the monitor.

For connecting and commissioning the device, comprehension of the operating instructions as well as the operating instructions of ASI-MON360/ASi Control Tools360 system manual is necessary.

The orderer has to guarantee the traceability of the devices via the serial number.

Person protection function

The device fulfills a person protection function. Improper installation impairs the function! The manufacturer of the machine/plant in which the safety related system is used is responsible for the correct and safe total function of every individual safety component! Depending on the choice of safety devices used, the safety system as a whole may also be assigned to a lower safety category!

Technical data

Interface	
EtherCAT inteface	2 x RJ-45
Diagnostic and configuration interface	Ethernet
Card slot	chip card for storage of configuration data
ASi	
Cycle time	150 µs * (number of ASi-3 nodes + 2)
Voltage	30 V_{DC}
AUX	
Voltage	24 V_{DC}
Input	
Inputs safety, SIL 3, cat. 4	3 x 2 channels
Inputs digital, EDM	up to 12 standard inputs
Switching current	static 4 mA at 24 V, dynamic 15 mA at 24 V (T = 100 µs)
Power supply	out of AUX
Output	
Number of release circuits on the monitor	6
Max. contact load	1,2 A $_{DC-13}$ at 30 V, Σ = 7,2 A in sum (derating)
Power supply	out of AUX
Test pulse	minimum interval between 2 test pulses 250 ms, maximum pulse width 1 ms
Display	
LCD	indication of ASi addresses and error messages
LED power	power on
LED ect run	EtherCAT communication active
LED config error	configuration error
LED U ASi	ASi voltage OK
LED ASi active	ASi normal operation active
LED prg enable	automatic address programming enabled
LED prj mode	configuration mode active
LED AUX	auxiliary power ON
LED SI1 ... 6	state of inputs
LED SO1 ... 6	state of outputs
Environment	
Operating altitude	max. 2000 m
Ambient operating temperature	0 °C ... +55 °C
Storage temperature	-25 °C ... +85 °C
Housing	stainless steel, for DIN rail mounting
Protection category (EN 60529)	IP20
Tolerable loading referring to impacts and vibrations	according to EN 61131-2
Voltage of insulation	≥ 500 V
Weight	800 g
Dimensions (W / H / D in mm)	110 / 120 / 96

Safety characteristics

Characteristics	Value	Standard
Safety category	4	EN ISO 13849-1
Performance Level (PL)	e	EN ISO 13849-1
Safety Integrity Level (SIL)	3	EN 61508
Service life (T_M) [year]	20	EN ISO 13849-1
Maximum power-on time [month]	12	EN 61508
PFD (1)	9,58 x 10^{-07}	EN 61508
PFH (1) [1/h]	5,17 x 10^{-08}	EN 61508, EN 62061

(1) The failure rates are specified for a maximum ambient temperature of 50° C.

Max. reaction time [ms]

Characteristics		Value	Standard
Safe Link	→ local output	10	EN 61 508
Safe Link	→ ASi	20	
ASi	→ local output	30	
ASi	→ Safe Link	30	
ASi	→ ASi	35	
local input	→ Safe Link	20	
local input	→ ASi	20	
local input	→ local output	20	

If the option „augmented reliability" is selected the response time will extend (see „ASIMON360/ASi Control Tools360 system manual").

In addition to the reaction time in the monitor, reaction times of the other components interlinked in the safety path also may have to be added. For details please see further information in the ASIMON360 manual and also the technical data for the respective devices.

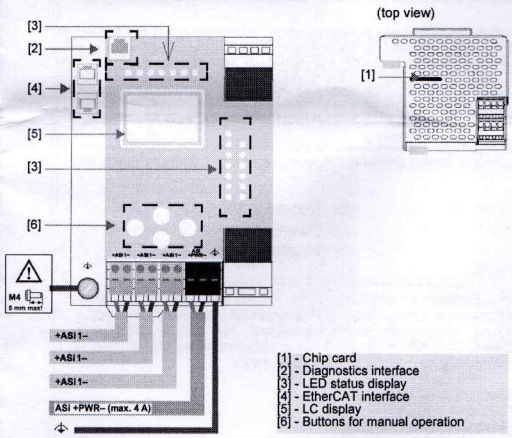
If outputs are set up as inputs, the input current has to be limited externally to 100 mA (slow-blow fuse).

Inputs can only be supplied by the same 24 V source than the device itself.

In case of an error, a disengaged output can be activated for a short period of time (≤ 1 ms).

If a regenerative consumer is connected to an output, shut-off of the second output of the group (SO1/2, SO3/4, SO5/6) may be delayed under a fault condition.

Connections and controls



[1] - Chip card
[2] - Diagnostics interface
[3] - LED status display
[4] - EtherCAT interface
[5] - LC display
[6] - Buttons for manual operation

+ASi1–

Connection to 1st ASi circuit

ASi +PWR– (max. 4 A)

ASi circuit 1 supply voltage

SI1, SI2, SI3, SI4, SI5, SI6

Inputs either for connecting of floating contacts, or OSSDs, or standard inputs.

SO1, SO2, SO3, SO4, SO5, SO6

Semiconductor outputs are short-circuit -and overload protected.
Clamps SO1 ... SO6 either for connecting of floating contacts or OSSDs or standard inputs.
Max. contact load: 1,2 A_{DC-13} at 30 V, Σ= 7,2 A in sum (derating)

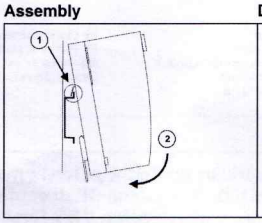
T1, T2

Clock outputs for connection of floating contacts. Current limitation to 125 mA.

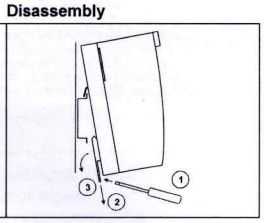
0 V, 24 V

Supply for semiconductor and test outputs as well for inputs out of auxiliary 24 V_{DC}.

Assembly



Disassembly



The device is mounted on 35 mm standard rails in accordance with EN 60715.

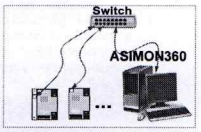
For assembling, position the device on the upper edge of the standard rail and then snap it onto the bottom edge.

The ASi and/or the 24 V must be supplied by a PELV power supply. Its maximum output voltage may not exceed 42 V even in the case of a fault!

The device should be installed in a control cabinet with a protection type of at least IP54!

Connection

10	0,2 ... 2,5 mm²
10	0,2 ... 2,5 mm²
AWG	24 ... 12



The devices have to be connected to an external switch, if using the ethernet diagnostic interface for safe coupling (via) Safe Link respectively for the connection with the ASIMON360 software.

Professional installation

Electrical installation is to be performed by qualified personnel. During installation, make sure that supply and signal cables and also the ASi bus cable are laid separately from high-voltage cables. In the switching cabinet, it must be ensured that appropriate spark extinction equipment is used for contactors. If drive motors and brakes are used, observe the installation instructions in the corresponding operating manual. Please note that the maximum cable length of the ASi bus cable is 100 m. Cable lengths longer than this require the use of suitable cable extensions.

When installing the cables, make sure that no parasitic voltages can arise.

It is essential to adhere to the prescribed fuse protection; this is the only way of guaranteeing safe disconnection in the case of a fault.

Maintenance

The proper function of the device within the system to be secured, i.e. the safe shutdown following the triggering of an assigned safety related sensor or switch, is to be checked at least once a year by the safety officer.

For this purpose, every safety related input (connected locally or over a safety related SaW module) must be activated at least once per year and the switching behavior must be inspected by monitoring the output circuits of the device.

The maximum power-on time and total operating time depends on the PFD value selected for the overall failure probability.

When the maximum power-on time has been reached (see safety characteristics), the safety system must be checked to ensure that it is functioning correctly by prompting the shutdown function.

When the maximum service life (T_M) has been reached, the device must be checked at the manufacturer's factory to ensure that it is functioning correctly.

EG-Konformitätserklärung – Original
EC-Declaration of Conformity – Original
Déclaration CE de conformité des machines – Original
Dichiarazione CE di conformità – Originale
Declaración CE de conformidad – Original

EF-overensstemmelseserklæring – Original
EG-försäkran om överensstämmelse – Original
EG-verklaring van overeenstemming – Oorspronkelijke
Declaração de Conformidade CE – Original

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EG-Konformitätserklärung // EC-Declaration of Conformity // Déclaration CE de conformité des machines // Dichiarazione CE di conformità // Declaración CE de conformidad // EF-overensstemmelseserklæring // EG-försäkran om överensstämmelse // EG-verklaring van overeenstemming // Declaração de Conformidade CE

2014/30/EU, 2006/42/EC, 2011/65/EU

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Art.-Nr. // Art. no. // N° art. // Cod.Art. // Art. N°. // Art.-nr. // Art.-nr. // Art.-nr. // N.º de referência	Bezeichnung // Denomination // Désignation // Denominazione // Denominación // Betegnelse // Beteckning // Benaming // Designação	Seriennummer // Serial number // Numéro de série // Numero di serie // Número de serie // Serienummer // Serienummer // Serienummer // Número de série
BWU2797	**ASI-3 EtherCAT Gateway with Integrated Safety Monitor, 1 ASI master**	**XX2301XXXXXX0001-XX2452XXXXXX9999**

Angewandte Normen // Applied standards // Normes applicables // Norme applicate // Normas aplicadas // Anvendte normer // Tillämpade standarder // Toegepaste normen // Normas aplicadas

EN 62026-2:2013
EN 62061:2005+Cor.:2010+A1:2013+A2:2015
EN ISO 13849-1:2015
EN 50581:2012
EN 61000-6-2:2005/AC:2005
EN 61131-2:2007/A1:2011
EN ISO 13849-2:2012
EN 61000-6-4:2007/A1:2011
EN 61326-3-1:2008
EN 61508:2010

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68199 Mannheim, Germany

Dokumentationsbevollmächtigter // Authorised representative // Responsable documentation // Responsabilità della documentazione // Agente documental // Befuldmægtiget for dokumentationen // Dokumentationsansvarig // Documentatiegevolmachtigde // Pessoa autorizada a compilar a documentação técnica

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Floßwörthstraße 41
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Nummer der EG-Baumusterprüfbescheinigung // Number of EC Type-Examination Certificate // Numéro de l'attestation d'examen CE de type // Numero dell'attestato di esame CE del tipo // Número del certificado de examen „CE de tipo" // Nummer på EF-typeafprøvningsattesten // Nummer för EG-typkontrollintyget // Nummer van de verklaring van het EG-typeonderzoek // Número do certificado de exame CE

44 205 16024506001

Benannte Stelle // Notified body // Organisme notifié // Organismo notificato // Organismo notificado // Bemyndigede organ // Anmält organ // Aangemelde instantie // Organismo notificado

0044
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Am TÜV 1
45307 Essen, Germany

Mannheim, 02.11.2022

Bernhard Wiedemann
(Geschäftsführer // CEO // Gérant // Gerente // Gerente // Direktør // Verkställande direktör // Directeur // Gerente)

Bihl + Wiedemann

UK-Declaration of Conformity

SI 2012 No. 3032 (RoHS)
SI 2016 No. 1091 (EMC)
SI 2008 No. 1597 (Machinery)

On behalf of Bihl+Wiedemann GmbH, I declare that, on the date the equipment accompanied by this declaration is placed on the market, the equipment conforms with all technical and regulatory requirements of the above listed directives, regulations and standards.

Art. no.	Denomination	Serial number
BWU2797	**ASi-3 EtherCAT Gateway with integrated Safety Monitor, 1 ASi master**	**XX2301XXXXXX0001-XX2452XXXXXX9999**

Applied standards

EN 62026-2:2013
EN 62061:2005+Cor.:2010+A1:2013+A2:2015
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EN ISO 13849-2:2012
EN 61000-6-4:2007/A1:2011
EN 61326-3-1:2008
EN 61508:2010

Manufacturer

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Floßwörthstraße 41
68199 Mannheim, Germany

Authorised representative

Bernhard Wiedemann
Floßwörthstraße 41
68199 Mannheim, Germany

Number of UK Type-Examination Certificate

44 205 16024506001

Notified body

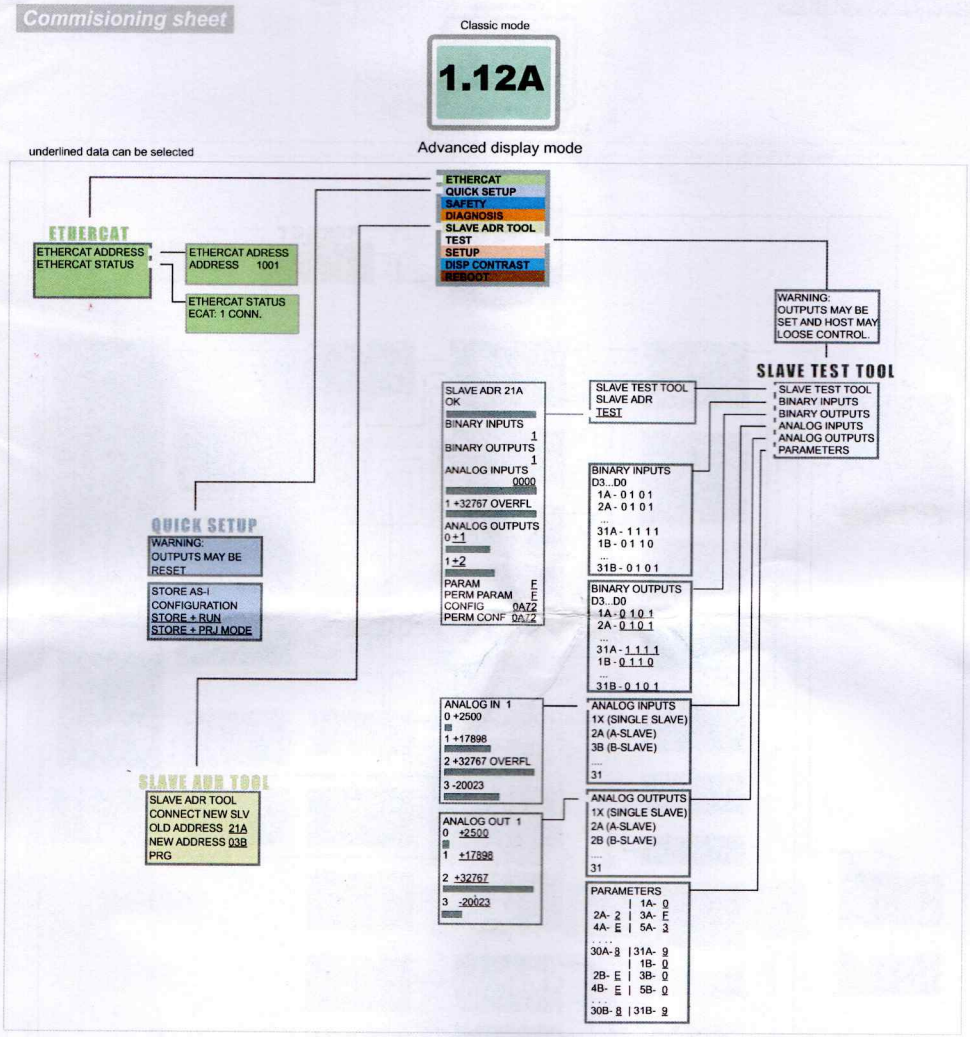
0044
TÜV NORD CERT GmbH
Am TÜV 1
45307 Essen, Germany

Mannheim, 15.11.2022

Bernhard Wiedemann
(CEO)

Bihl + Wiedemann

Commisioning sheet



Basic Operation

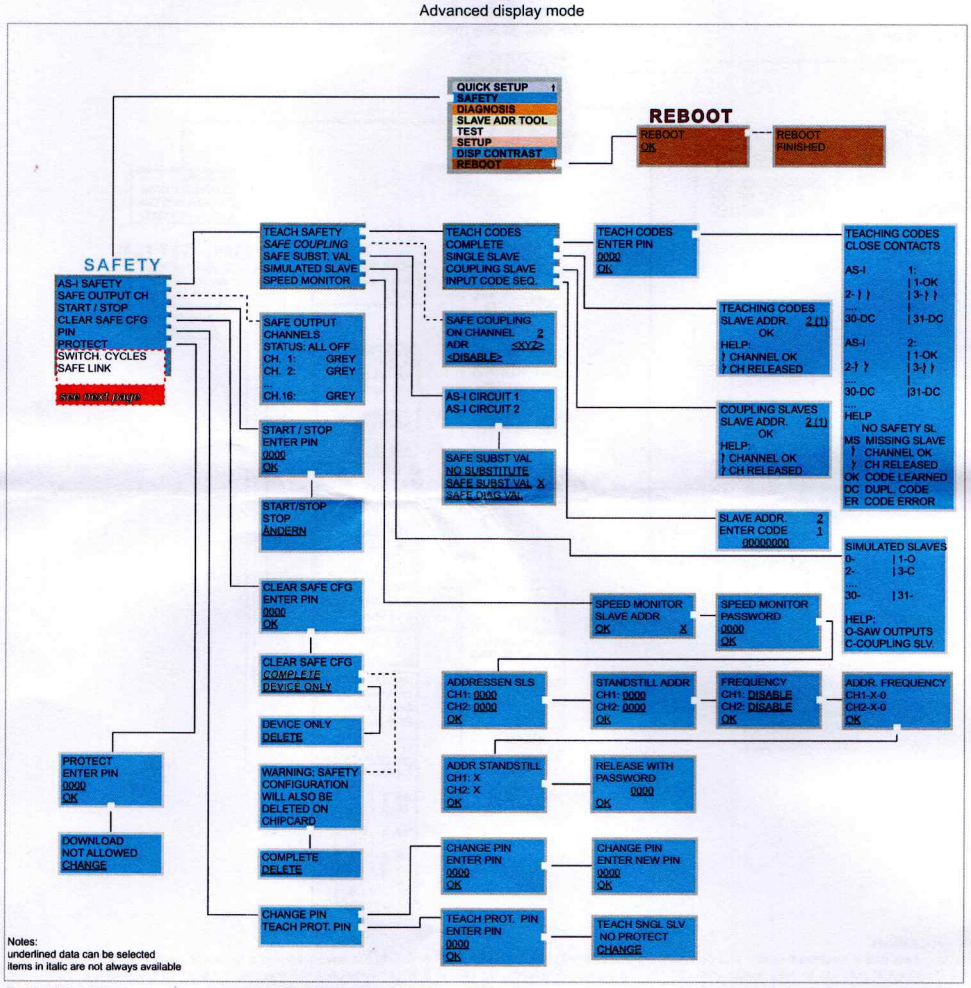
The device starts in the traditional mode. You can switch between the two modes with ESC or OK. In the advanced mode the cursor is moved by the arrow buttons. Pushing OK puts you to the superior menu (in the drawing one step to the right side). ESC puts you back to the previous menu. To edit data move with arrow buttons the marking to desired line first and then select the item with OK, change the data by using the arrow buttons and finally press OK button to accept the input. Pushing ESC cancels the editing.

Commissioning sheet

Classic mode

1.12A

Advanced display mode



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1.12A

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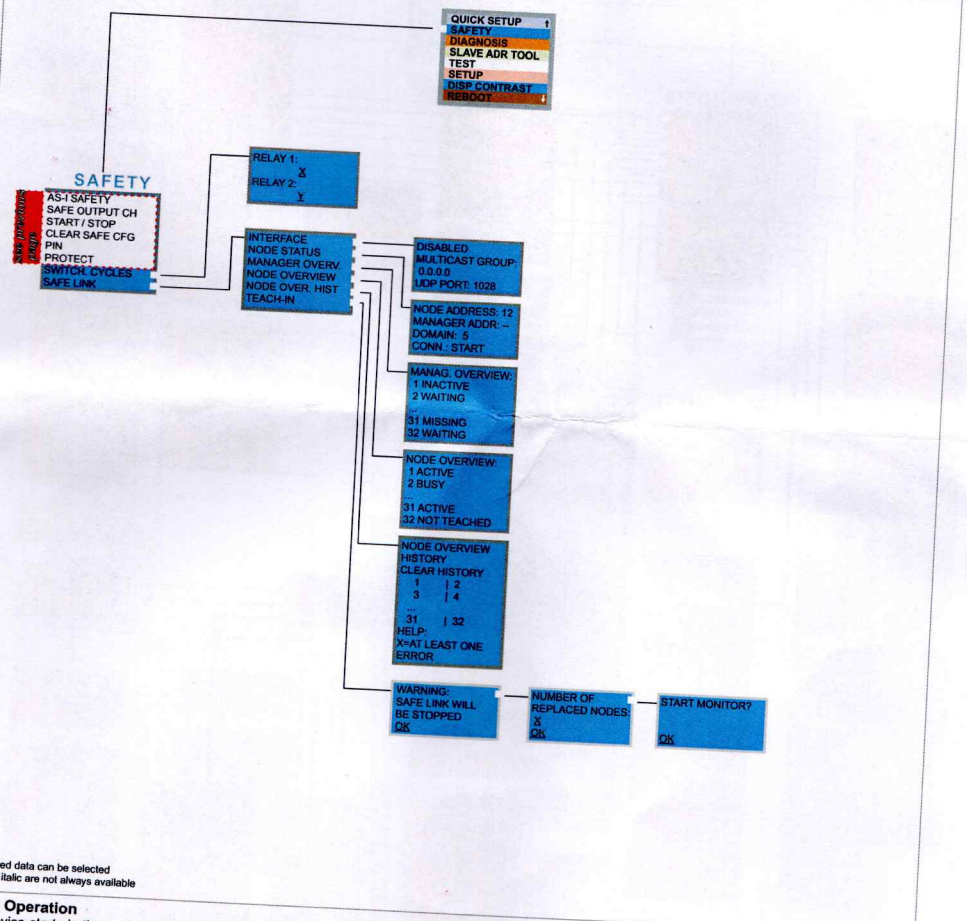

Notes:
underlined data can be selected
items in italic are not always available

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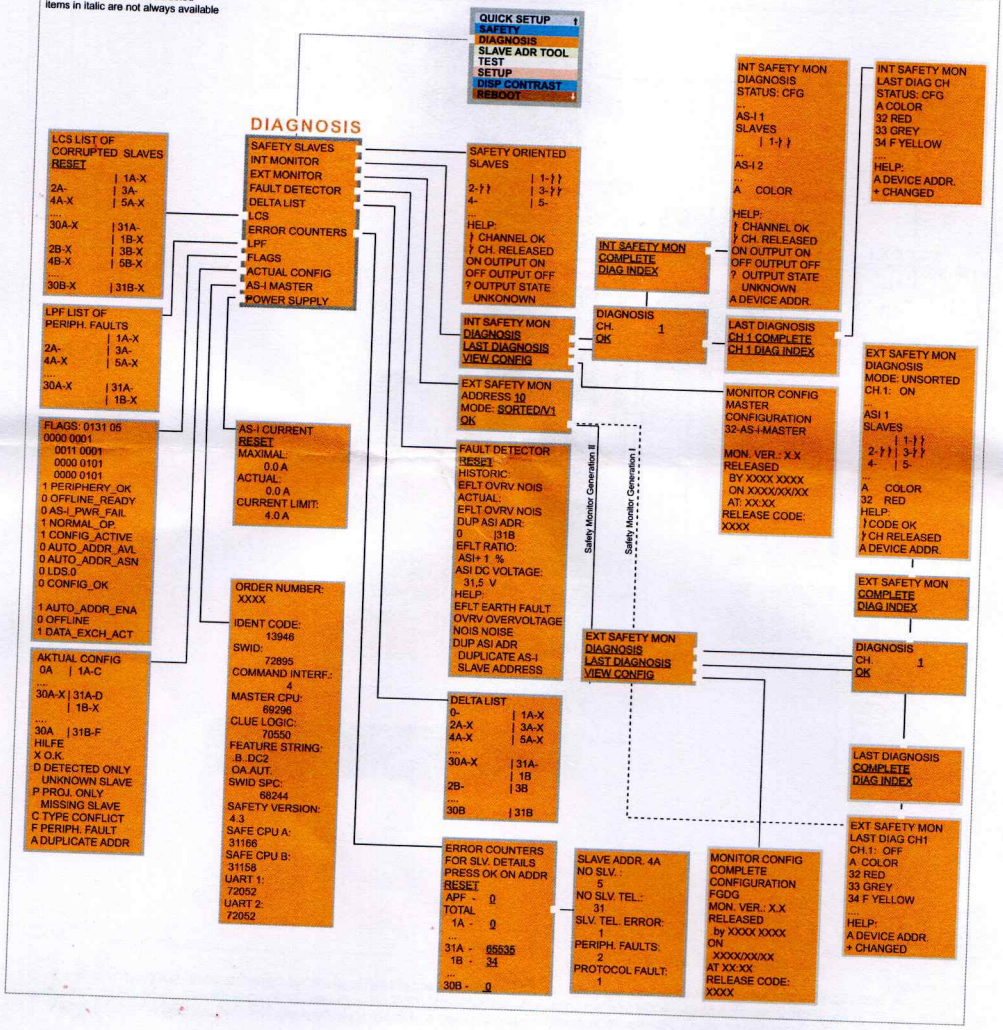

Bihl + Wiedemann

Commissioning sheet

Classic mode

1.12A

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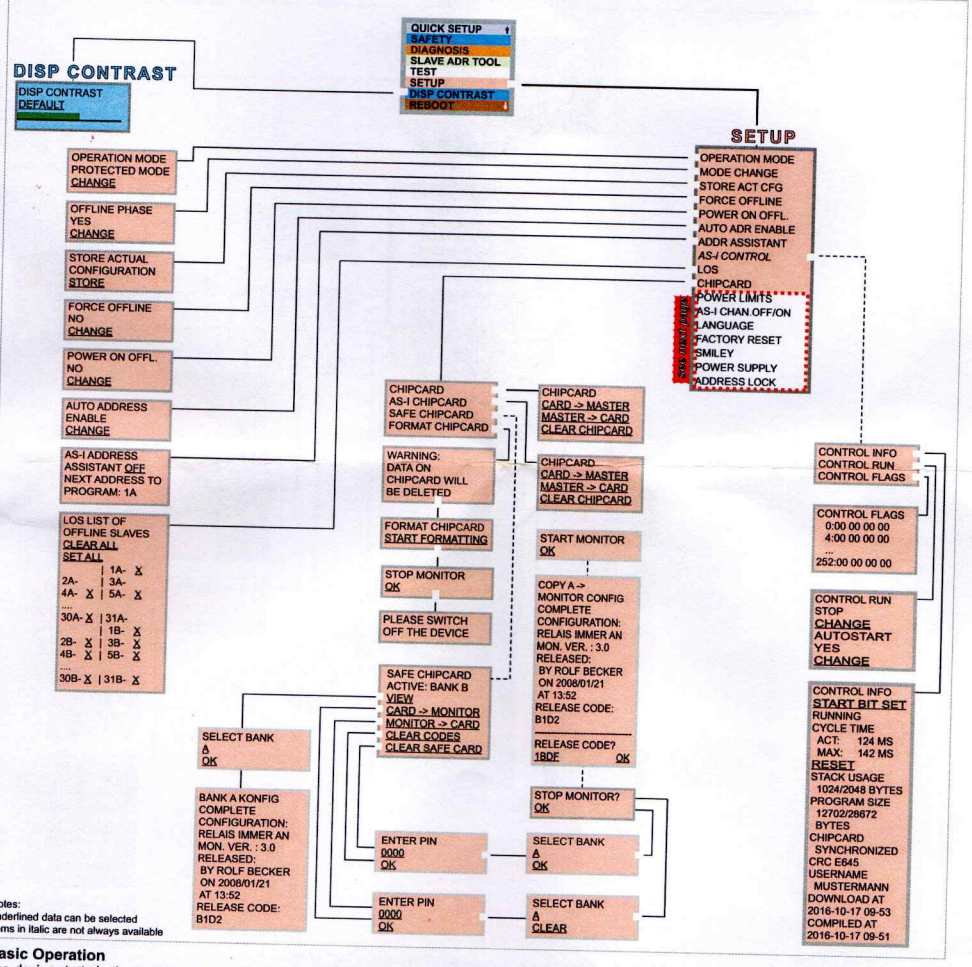

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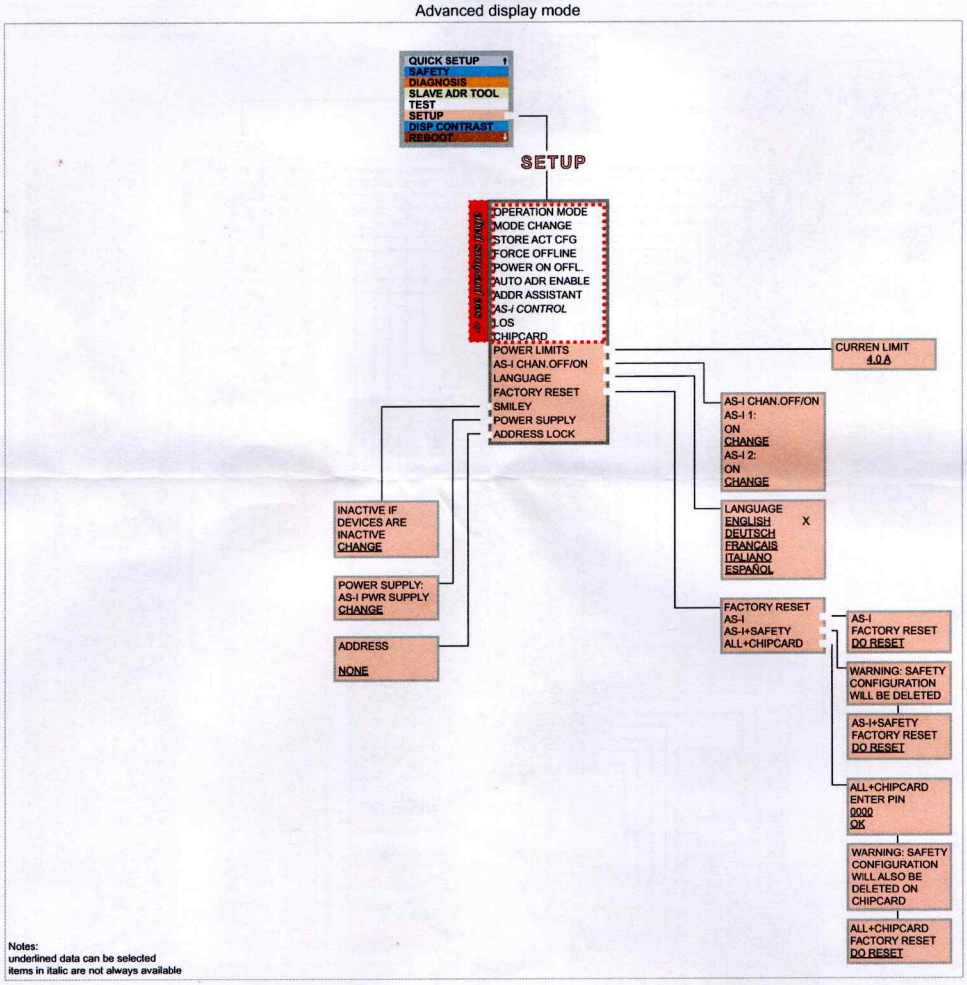

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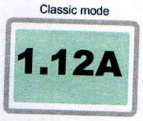
Commissioning sheet

Classic mode



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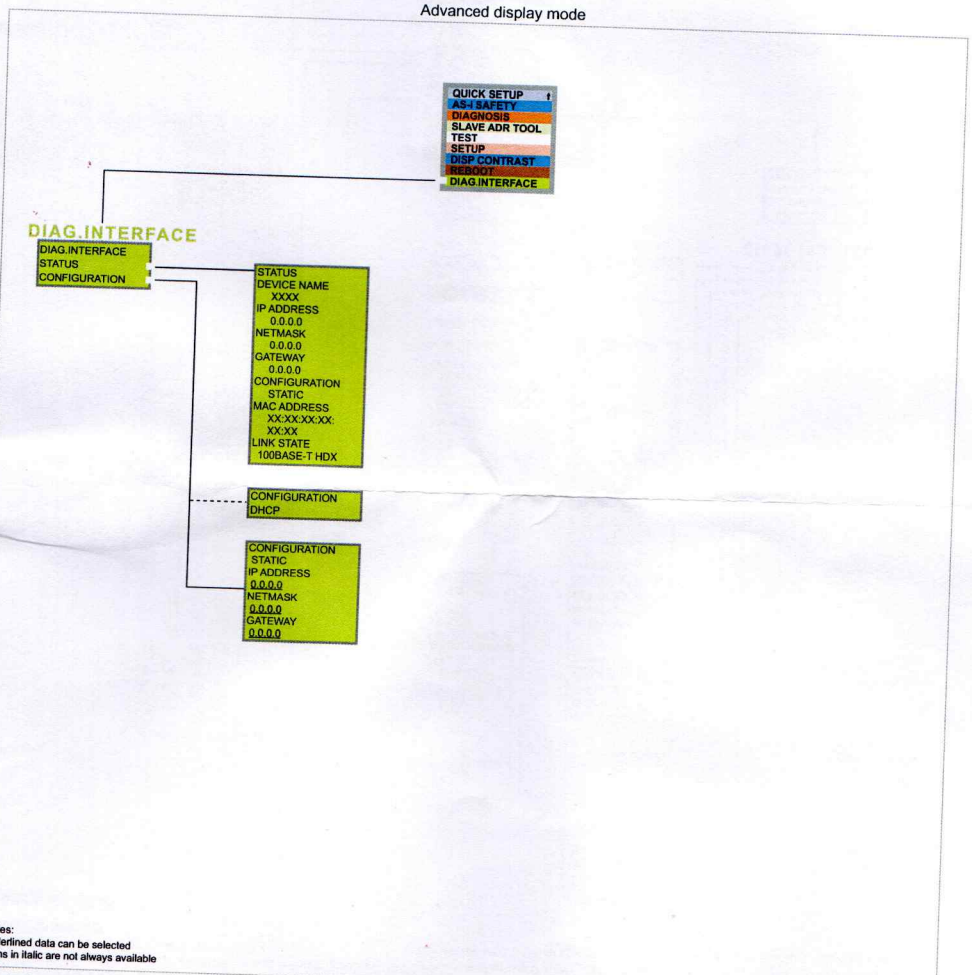

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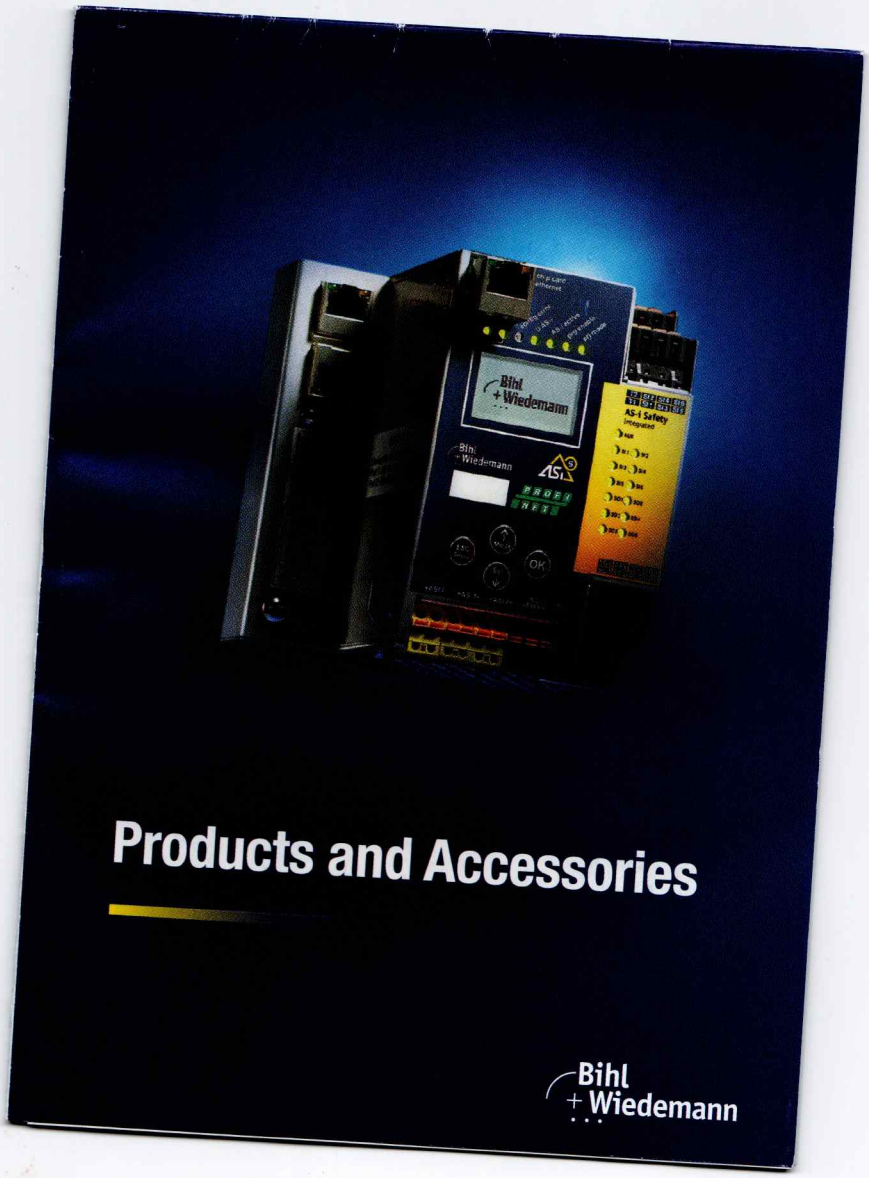

Products and Accessories

Bihl
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ASi Master

ASi-5/ASi-3 Gateways w. 2x8A integrated decoupling, e.g. PROFINET, EtherNet/IP+ ModbusTCP

ASi-5/ASi-3 Gateways, e.g. PROFINET, EtherNet/IP+Modbus TCP, EtherCAT, POWERLINK, OPC UA

24 Volt ASi-5/ASi-3 Gateways, e.g. PROFINET, EtherNet/IP+Modbus TCP, EtherCAT, POWERLINK, OPC UA

ASi 3.0 PROFIBUS Gateways with Ethernet diagnostic

ASi 3.0 Master for Allen-Bradley Compact-/ MicroLogix

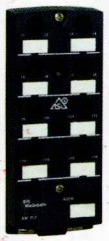
PROFIBUS PROFINET EtherNet/IP EtherCAT Modbus CANopen DeviceNet BACnet ETHERNET POWERLINK

ASi Digital I/O Modules

ASi Digital Modules IP20, 8I/8O, 4I/4O, 4I/4O relay, 4I/3O relay

ASi-5 Digital Modules IP20; 16I, 16O, 8I/8O, 8I

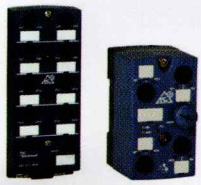
Active Distributors ASi; 4I/4O, 4I, 4O, 4I/O



ASi-5 Digital Modules IP67, M12; 16I, 16O, 8I/8O, 8I, 8O

ASi Digital Modules IP67, M12; 8I/8O, 8I, 8O, 4I/4O, 4I, 4O, 2I/2O

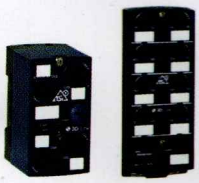
ASi-5 Self-configuring I/O Modules



ASi-5 Modules, IP67, M12, 16I/O, 8I/O

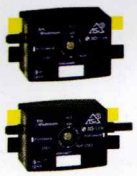
ASi-5 Modules, IP20, 16I/O

ASi-5 Modules with integrated IO-Link Master



IO-Link Master in IP67 with up to 8 Ports

IO-Link Master in IP20, with 4 Ports



Active Distributor IO-Link Master with 1 or 2 Ports

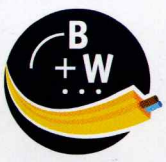
Analog Modules

ASi Analog Modules IP67, 2I, 2O 4...20 mA, 0...10 V, Pt100

ASi Analog Modules IP20, 2I, 2O; 4...20 mA, 0...10 V, Pt100

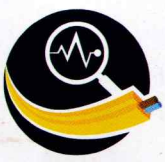
ASi Analog Modules IP20, 4I, 4O; 4...20 mA, 0...10 V, Pt100

Software



Bihl+Wiedemann Safety Suite

Bihl+Wiedemann Suite



Diagnostic Software

PROFINET Master Simulator

EtherNet/IP Master Simulator

Programming in C; Activation of the control functionality

Safety Components

Safety Monitor

ASi-5/ASi-3 Gateways with integrated Safety Monitor, e.g. PROFINET, EtherNet/IP+Modbus TCP, EtherCAT, POWERLINK, OPC UA

ASi PROFIBUS Gateways with integrated Safety Monitor

Safety Basic Monitors

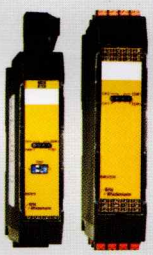
PROFINET, PROFIBUS, CC-Link, sercos, CANopen, EtherNet/IP, EtherCAT, CIP Safety, Safety over EtherCAT, safe link, BACnet, POWERLINK, Modbus

Safety I/O Modules

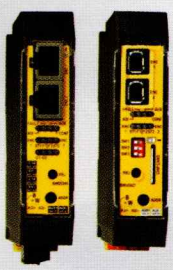
Safety Modules in IP20 with Safety inputs and/or Safety outputs and Standard I/Os

Safety Modules in IP67 with Safety inputs and/or Safety outputs and Standard I/Os

Safe Contact Expander/Speed Monitors / Safety Analog Modules



Safe contact expansion up to 20 A

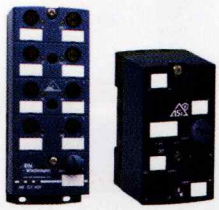


Speed Monitors for sine/cosine, SSI, TTL or HTL-Encoder

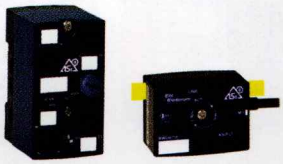
Safety Analog Input Modules, IP20

Function Modules

Drive Solutions

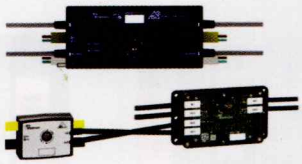


Modules for 24 V/48 V roller drives, e.g Interroll, Itoh Denki, Rollex, Rulmeca



Modules for frequency drives, e.g. for SEW, Lenze, Allen Bradley, NORD Motors

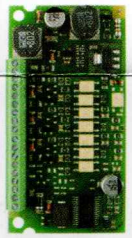
ASi Module for Lenze Smart Motor



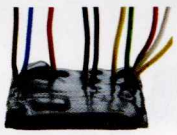
Cable duct modules for 24 V/ 48 V roller drives, e.g Interroll, Itoh Denki, Rollex, Rulmeca

Circuit Board Modules

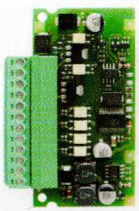
Circuit boards 29,7 mm x 36,5 mm; 1I/1O, 2I/2O



Circuit boards 73 mm x 37,5 mm; 4I/3O, 4I/4O, 8I, 6O

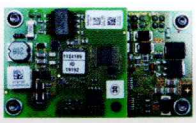


Safety Circuit boards 43 mm x 30 mm; 2I/2O, 2O



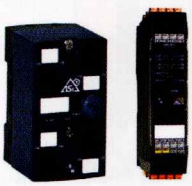
Safety Circuit boards 73 mm x 37,5 mm; 2O

Safety Circuit boards 85 mm x 80 mm; 2I/2O



Cirtuit Borads ASi-5, 70 mm x 40 mm; up to 16I/O, up to 4 x IO-Link Ports

Specialties/Function modules



ASi-5 Counter Modules, IP67/IP20

Active Distributor ASi-5 to control RGB Lights

ASi/ASi Couplers, IP20

Accessories

Power Supplies

30 V power supply, optimized for ASi-5/ASi-3

1 phase

3 phases

NEC class 2

Circuit Extension / Diagnostics

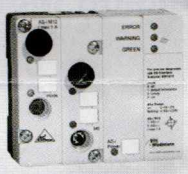
Advanced Repeaters IP20/IP65

ASi-5/ASi-3 Address Programming Device

ASi Bus Terminations

ASi-5/ASi-3 Function and EMC Test Master

ASi Analyser

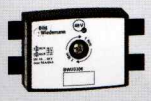


ASi Diagnostic Tuners

Active and Passive Distributors

With round cable

With Push-In terminals

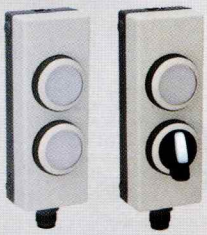


As profile cable branch

With M12 socket

Switches / Buttons

ASi Safety E-STOP Button Modules (lighted/unlighted)



ASi Light Button Modules

E-STOP Buttons

Headquarters

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www.bihl-wiedemann.com

Information on proper disposal

The symbol of a crossed-out wheeled bin on a device indicates that it must be disposed of as WEEE within the meaning of Directive 2012/19/EU and must not be discarded as household waste.
Such waste equipment contains heavy metals that are harmful to the environment and human health, but it also has valuable raw materials that can be recycled this way. This protects both the environment and human health while conserving natural resources.

Dispose of the device through the relevant channels. Dispose of spent batteries at the designated collection points. Comply with all local and currently applicable laws and regulations.

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