



## ROBUST 42, 44/AS-i

### Multiple Light Beam Safety Devices


**Additional informations about Connecting and Operating  
Instructions of ROBUST 42, 43, 44 Multiple Light Beam  
Safety Devices**



## About the Connecting and Operating Instructions



These Connecting and Operating Instructions contain additional information and instructions for the Connecting and Operating Instructions of ROBUST 42, 43, 44 multiple light beam safety devices, through the effective use of ROBUST 42, 44/AS-i multiple light beam safety devices with integrated AS-i interface as described in the specifications.

Safety tips and warnings are indicated by the  symbol.

Pointers to important items of information are indicated by the  symbol.

**Leuze lumiflex GmbH + Co. KG will not be responsible for damages that occur through inappropriate use of the equipment. Knowledge of the contents of these Connecting and Operating Instructions shall be considered a part of the correct use of the equipment.**

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# 1 General Remarks

## 1.1 Short description

The ROBUST 42, 44/AS-i multiple light beam safety devices are type 4 Active Optoelectronic Protective Devices (AOPDs) in accordance IEC 61496-1, -2 and EN 61496-1. They can be connected to AS-Interface, as they have an integrated AS-i interface as part of their design. Between the transceiver (transmitter and receiver module, both included in a single housing) and a deflecting mirror a protective field is set up, consisting of infrared beams. When a person penetrates this protective field, the machine that is protected by AS-Interface and the AS-i safety monitor will be brought to a state of safety before the person can get into any situation of danger that might be caused by the machine.



A short description of the AS-Interface safety system may be found in Chapter 1.6.

## 1.2 Manufacturer's certification



The manufacturer of the ROBUST 42, 44/AS-i multiple light beam safety devices, Leuze lumiflex GmbH + Co. KG, of 82256 Fürstentfeldbruck, Germany, is in possession of a quality assurance system that has been certified in keeping with ISO 9001.

ROBUST 42, 44/AS-i multiple light beam safety devices have been developed and are manufactured in adherence to the European standards and directives that apply to such articles.

## 1.3 Approval and EC declaration of conformity

EC prototype testing (Europe)  
in compliance with DIN EN 61496-1

TÜV NORD CERT  
Am TÜV 1  
30519 Hannover



The declaration of conformity will be found at the end of these Connecting and Operating Instructions.

## 1.4 Definition of terms (on AS-Interface)

### **Output switching element (safety output) of the AS-i safety monitor**

An element that is activated by the monitor's program logic, which is in a position safely to switch off the control components subordinated to it. Only when all components function as indicated in the specifications should the output switching element be put into or allowed to remain in the On state.

### **OSSD**

The one channel of the AS-i safety monitor to which safety-related AS-i components and functional components are assigned which are responsible for releasing the machine elements which create the unsafe movement.

### **Integrated AS-i slave**

Component in which sensor and/or actuator functions are incorporated with the slave in a single unit.

### **AS-i Master**

Component for data transmission, which controls the logical and temporal behaviour of the system on the AS-i line.

### **Safety output**

See output switching element.

### **Safety-related input slave**

Slave which reads the safety-related states On and Off of the sensor or command unit to which it is connected and transmits it to the master or safety monitor.

### **Safety-related AS-i slave**

Slave for connecting safety-related sensors, actuators and other devices.

### **Safety monitor**

Component which monitors the safety-related slaves and the correct functioning of the network.

### **Slave**

Components for data transmission; the master cyclically addresses these components by their addresses. Only then do they generate an answer.

### **Standard slave**

Slave for connecting non-safety-related sensors, actuators and other devices.

## 1.5 Abbreviations

<b>AS-i</b>	Actuator Sensor Interface (also known as AS-Interface)
<b>AOPD</b>	Active Optoelectronic Protective Device
<b>OSSD</b>	Output Safety Switching Device
<b>PLC</b>	Programmable Logic Control
<b>EDM</b>	External Device Monitoring

## 1.6 Short description of the AS-Interface

The actuator-sensor interface (AS-interface, in short: AS-i) has established itself as a system for net-working primarily binary sensors and actuators at the lowest level of the automation hierarchy. The high number of installed systems, the ease of use and the reliable operating behaviour also make the AS-interface interesting in the area of machine safety.

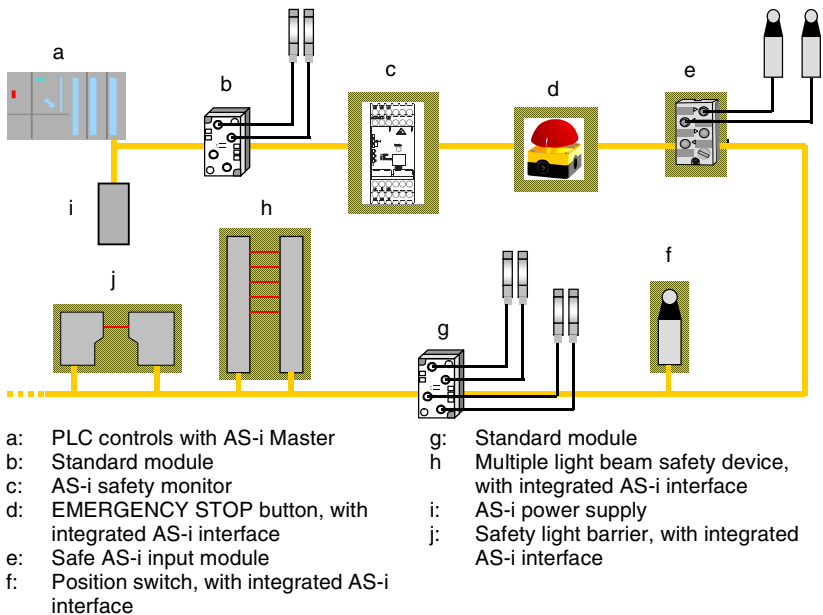
The safe AS-Interface system is intended for safety applications up to category 4 in accordance with EN 954-1. A mixed manner of operation, using both AS-i standard components and AS-i safety-related components, is possible.



A comprehensive description of safe AS-i transmission will be found in the Connecting and Operating Instructions for the AS-i safety monitor, Chapter 11.

### 1.6.1 The AS-i safety monitor

Within an AS-i system, corresponding to the configuration that the user has specified by means of the configuration software, the AS-i safety monitor keeps a check on the safety-related AS-i slaves that are allocated to it. Depending on the device model, up to two dependent or independent OSSDs with contactor monitoring are available. In case of a Stop request or of a fault occurring, the AS-i safety monitor in protective mode will safely switch the system off, with a response time of 40 ms when the system is fully extended. It is possible in this connection to link as many as 31 safety-related AS-i slaves into a system.



**Fig. 1-1:** Safe and standard components in an AS-i network

Multiple AS-i safety monitors can be used within an AS-i system. In this way, a safety-related AS-i slave can be monitored by multiple AS-i safety monitors.

## 1.6.2 The safety-related AS-i slave

The safety-related information of the AS-i slave is transmitted by way of the non-safety-related transmission channel used by Standard AS-i. The same transmission mechanism applies to a safety-related transmission as it does to the Standard AS-Interface, that is to say, the 4-bit information that is delivered to the AS-i slave-IC will be transmitted. From a transmission perspective, information is transmitted from master to slave and back again, but the safe data information is sent from the slave to the AS-i safety monitor only, which "listens in" to the entire exchange of information and monitors what is transmitted. Here the safety-related user data are defined as follows:

- Only 1 bit of user information is transmitted. The two possible states are interpreted as meaning **free** (=1) and **not free** (=0).

*Example:*

Emergency stop not activated = **free** ("hazardous movement approved")

Emergency stop activated = **not free** ("hazardous movement not approved")

- In the **not free** state the values 0,0,0,0 are statically registered in the 4 input bits of the AS-i slave-IC.
- In the **free** state, with every cycle a different value is registered in the 4 input bits. The values amount to a sequence of 8 4-bit values which vary in pairs, in such a way that each slave in the system has its own unique sequence. After the eighth sequence has been successfully transmitted, the system switches to the first sequence again (endless loop). The sequence is registered in a code table of the AS-i slave and can be generated in keeping with defined rules. It is assigned by the manufacturer of the AS-i slave as part of the manufacturing process.

Data bit	Light path free	Light path interrupted
D0	Code sequence	0
D1	Code sequence	0
D2	Code sequence	0
D3	Code sequence	0

**Table 1-1:** Allocation of the data bits of the safety-related AS-i slave

## 2 Safety Notices

### 2.1 General safety notices



ROBUST 42, 44/AS-i multiple light beam safety devices with integrated AS-i interface are intended exclusively for connection to AS-Interface Safety at Work and may not be used with any other applications. ROBUST 42, 44/AS-i multiple light beam safety devices can only be connected with the machine controls by way of AS-Interface and the AS-i safety monitor.



Appropriate use of the ROBUST 42, 44/AS-i multiple light beam safety devices shall entail the knowledge of the contents of the Connecting and Operating Instructions for the ROBUST 42,43,44 multiple light beam safety devices and ROBUST 42, 44/AS-i multiple light beam safety devices. For operating the ROBUST 42, 44/AS-i multiple light beam safety devices with AS-Interface, the user should also be familiar with the contents of the Connecting and Operating Instructions for the AS-i safety monitor and the user's manual on the asimon configuration and diagnosis software for the AS-i safety monitor.



Please pay attention to the safety notices contained in the Connecting and Operating Instructions for “ ROBUST 42,43,44 multiple light beam safety devices ”.

## 2.2 Proper use



The protection of operating personnel and equipment cannot be guaranteed, if the equipment is not used in keeping with the mode of use specified.

Tampering with or modification of the equipment, unless in a way expressly described in these instructions, is not permitted.

## 2.3 Areas of application (AS-Interface)

The AS-i safety monitor, when used in accordance with the specifications, allows for the operation of the sensor-controlled personnel protection facilities and other safety components up to and including category 4 as defined by EN 954-1. If sensors of a lower category should be used, the maximum category to be attained for the related safety path is defined in terms of these sensors. For example, laser scanners as defined by EN 61496-3 can only be classified as type 3 at best. If laser scanners are incorporated in the AS-i safety network, a safety category of 3 is the maximum that may be attained for the related safety path. If there is a multiple light beam safety device of type 4 connected to the same AS-i safety monitor, it remains unaffected by this, and may still be classified as category 4. The AS-i safety monitor also takes responsibility for the EMERGENCY STOP function, obligatory for all machines not operated by hand (stop category 0 or 1), for the dynamic monitoring of the restart function and for the electronic device monitoring function. In what follows we will give a few examples of the use of the AS-i safety monitor.

AS-i Safety at Work can be economically used in all cases where the standard AS-i bus recommends itself in view of its advantages as a local bus that requires little cabling. In this way, when the AS-i safety monitor is used, AS-i bus configurations that already exist as bus user devices can easily be added to, and safety components with the appropriate AS-i Safety at Work interface (e.g. ROBUST/AS-i) can easily be incorporated in the loop. If the safety component does not have an AS-i Safety at Work interface, what are known as coupling modules (e.g. the AS-i coupling module ASKM1) can effect the connection. Existing AS-i Masters and AS-i network components can as a rule be reused. In terms of industrial sector there are no limitations. Let us mention here a few of the more important areas of use:

- Expanded machining machines with multiple control elements and safety sensors for wood and metal applications
- Printing and paper processing machines, cutting machines
- Packaging machines, single and as part of a system
- Food processing equipment

- Piece and bulk material transport systems
- Machinery in the rubber and plastics industry
- Assembly machines and manipulators

## 2.4 Organisational measures

### Documentation

It is an absolute requirement that regard should be had to all the statements made in these Connecting and Operating Instructions, in particular in the Chapters “Safety Notices” and “AS-i System Integration”. Please look after these Connecting and Operating Instructions and treat it with care. It should be available at all times.

### Safety prescriptions

You should have regard to the statutory stipulations that apply locally and to the prescriptions of the relevant professional associations.

### Qualified personnel

The assembly, startup and maintenance of the equipment should be carried out only by qualified professional personnel. Electrical work may be carried out only by a professional electrician.

### Repairs

Repairs, in particular if they involve the opening of the casing, may only be carried out by the manufacturer or by a person whom the manufacturer has authorised.

### Disposal



Electronic scrap is special category waste, and you should have regard to the regulations that apply locally to the disposing of such materials. ROBUST 42, 44/AS-i multiple light beam safety devices do not contain any batteries that would need to be removed before the equipment is disposed of.

## 3 Structure and Function

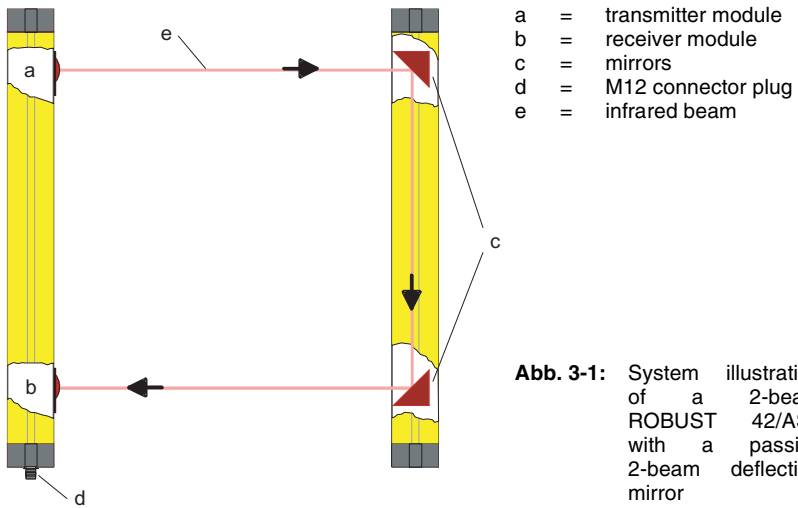


For this topic, see Chapter 3 of the Connecting and Operating Instructions for ROBUST 42, 43, 44 multiple light beam safety devices.

### 3.1 System Overview

The **ROBUST 42/AS-i** is a 2-light beam safety device. The transmitter/receiver system is arranged in a single profile, with a optical distance of 500 mm. In association with a passive deflecting mirror (e.g. PM2-500), it constitutes a functional unit.

The **ROBUST 44/AS-i** is a 4-light beam safety device. The transmitter/receiver system is arranged in a single profile, with a optical distance of 300 mm. In association with a passive deflecting mirror (e.g. PM4-300), it constitutes a functional unit.



## 4 Assembly



For this topic, see Chapter 5 of the Connecting and Operating Instructions for ROBUST 42, 43, 44 multiple light beam safety devices.

### 4.1 Calculation of clearance/Calculation of response time with AS-i applications

The clearance  $S$  between hazard location and the protection zone is calculated in accordance with EN 999 according to the following formula:

$$S = (K \times T) + C$$

where:

- S** Minimum clearance between the protection zone and the hazard location in mm
- K** Rate of approach by the body or the person in mm/ms
- T** Overtravel time of the machine + the response time of the optoelectronic protection device (AOPD) + **the response time of the AS-i bus system in ms**
- C** Allowance in mm, which depends on the detection capacity  $d$  of the AOPD



The overall response time  $T$  is the time from the activation of the COMPACT/AS-i sensor to the machine-standstill. In case of AS-i applications it must be calculated the bus system time needed for AS-Interface data transmission and the AS-i safety monitor switch off (with a maximum of 40 ms) in addition to the sensor-response time and the machine-overtravel time.

## 5 Electrical Installation (from the AS-i side)

### 5.1 Prescriptions during installation



Regard should be had to the general advice on safety given in Chapter 2. The electrical installation is to be carried out by properly instructed professionals.

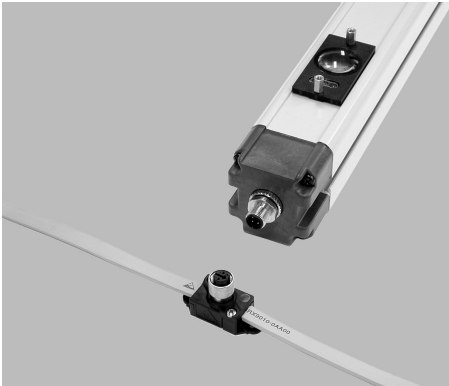
### 5.2 AS-Interface power supply



The AS-i network component for provision of power supply to the AS-i components (ROBUST/AS-i for instance) must have a secure isolation from supply as defined by IEC 60742, and must also be able to bridge short-term network power cuts lasting up to 20 ms.

### 5.3 Connection technology

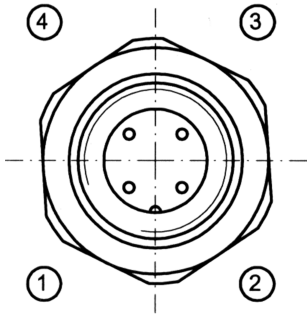
The sensors are designed with a 4-pole M12 connector plug for connection to the AS-i line. The connection to the AS-i line will normally be made by means of an M12 bus terminal (see Tips on Chapter 9, AS-i safety accessories).



**Fig. 5-1:** Connecting the sensor with an M12 connector socket by means of an M12 bus terminal to AS-Interface

Connector pin	Transceiver RRT 42/A	Transceiver RRT 44/A
1	ASI+	ASI+
2	not assigned	not assigned
3	ASI-	ASI-
4	not assigned	not assigned

**Table 5-1:** PIN assignment on the 4-pole M12 connector plug



**Fig. 5-2:** Coding of the 4-pole M12 connector plug

**i** For tips and information on the design, installation and operation of AS-Interface systems, we would recommend the AS-Interface instructions “Das Aktuator-Sensor-Interface für die Automation” [“The Actuator-Sensor Interface in Automated Systems”] by Werner R. Kriesel and Otto W. Madelung (ed.), published by the Carl Hanser Verlag [Carl Hanser Publishers] of Munich and Vienna.

## 6 AS-i System Integration

### 6.1 Installing of components/functional testing

**i** For this topic, see also the Connecting and Operating Instructions for the AS-i safety monitor, Chapter 7 (Functioning of the system and putting the system into operation), as well as the ROBUST 42, 43, 44 Connecting and Operating Instructions Chapter 4.1 (Function, Warning and Malfunction Messages).

You should proceed as follows:

<b>1</b>	<p><b>Give an address to the AS-i slave</b> The addressing is carried out by means of the M12 connector plug, using the standard AS-i addressing devices. Each address may only be used once on a AS-i network (possible bus addresses are 1 to 31).</p>
<b>2</b>	<p><b>Install the AS-i Slave in the AS-Interface</b> Connection is effected by means of an AS-i bus terminal or an M12 connecting cable.</p>
<b>3</b>	<p><b>Check that the sensor is power-supplied by way of AS-Interface</b> The red LED will light up on the ROBUST/AS-i transceiver device.</p>
<b>4</b>	<p><b>Functional control of the sensor in connection with the passive PMx deflecting mirror</b> The green LED lights up on the ROBUST/AS-i transceiver device.</p> <p><b>i</b> The light beam emitted by the transmitter unit is twice diverted by way of a deflecting mirror (e.g. PM2-500) through an angle of 90° and returned to the receiver unit. You can optimize the angle if you release the fastenings and determine the optical mid-point by tilting the device horizontally or vertically.</p>
<b>5</b>	<p><b>The safe AS-i slave can now be put into operation and configured with the help of the asimon configuration and diagnosis software of the AS-i safety monitor.</b></p>

## 6.2 Malfunctions and rectification of faults



For this topic, see the ROBUST Connecting and Operating Instructions, Chapter 4.1 (Function, Warning and Malfunction Messages), as well as the Connecting and Operating Instructions for the AS-i safety monitor, Chapter 9 (Status messages, malfunctions and rectification of faults).



For system integration, that is to say, for programming the code table of the AS-i slave into the AS-i safety monitor, the multiple light beam safety device must not be interrupted.

## 7 Maintenance





### 7.1 Replacement of safety-related AS-i slaves

If a safety-related AS-i slave is defective, it can also be replaced without using the PC, and the AS-i safety monitor may be reconfigured by means of the SERVICE button on the AS-i safety monitor.



For this topic, see the Connecting and Operating Instructions for the AS-i safety monitor, Chapter 9.4 (Replacing a defective safety-related AS-i slave).

You should proceed as follows:

<b>1</b>	<b>Isolate the defective AS-i slave from the AS-i line</b> The AS-i safety monitor ASM1 will bring the system to a halt.
<b>2</b>	<b>Press the SERVICE button on the AS-i safety monitor</b>
<b>3</b>	<b>Install the new AS-i slave</b>  As delivered from the factory, Leuze lumiflex AS-i slaves are assigned the bus address "0". When they are replaced, the AS-i Master will automatically program the replacement device with the former bus address of the defective device. Thus the re-assignment of the replacement device to the bus address of the defective device is not required.
<b>4</b>	<b>Check that the sensor is power-supplied by way of AS-Interface</b> The red LED will light up on the ROBUST/AS-i transceiver device.
<b>5</b>	<b>Functional control of the sensor in connection with the passive PMx deflecting mirror</b> The green LED lights up on the ROBUST/AS-i transceiver device.  The light beam emitted by the transmitter unit is twice diverted by way of a deflecting mirror (e.g. PM2-500) through an angle of 90° and returned to the receiver unit. You can optimize the angle if you release the fastenings and determine the optical mid-point by tilting the device horizontally or vertically.
<b>6</b>	<b>Press the SERVICE button on the AS-i safety monitor</b>  For system integration, that is to say, for programming the code table of the AS-i slave into the AS-i safety monitor, the multiple light beam safety device must not be interrupted.
<b>7</b>	<b>Activate the starting signal in order to restart the AS-i system</b>  The system will be restarted in dependence on the AS-i configuration of the AS-i safety monitor, which may involve a restart interlock or else an automatic restart (for this topic, see the asimon Users' Manual – Configuration and diagnosis software for the AS-i safety monitor ASM1).

When the SERVICE button is pressed for the first time, the system will ascertain whether just one AS-i slave is missing. This will be noted in the error memory of the AS-i safety monitor. The AS-i safety monitor now switches to configuration mode. When the SERVICE button is pressed for the second time, the code sequence of the new AS-i slave will be programmed in and checked for correctness. If this is found satisfactory, the AS-i safety monitor switches back into guard mode.



### Warning!

After a defective safety-related AS-i slave has been replaced, it is absolutely necessary that the correct functioning of the new AS-i slave should be checked.


## 7.2 Checking of safety switch-off procedure

The correct functioning of the safe AS-i system, that is to say, the safe switching off of the AS-i safety monitor when a safety-related sensor (ROBUST 42/AS-i, for instance) is triggered, should be checked by the safety officer on an annual basis.



For this purpose, the ROBUST 42, 44/AS-i slave should be activated once a year, and its switching properties checked by observing the safety outputs of the AS-i safety monitor.

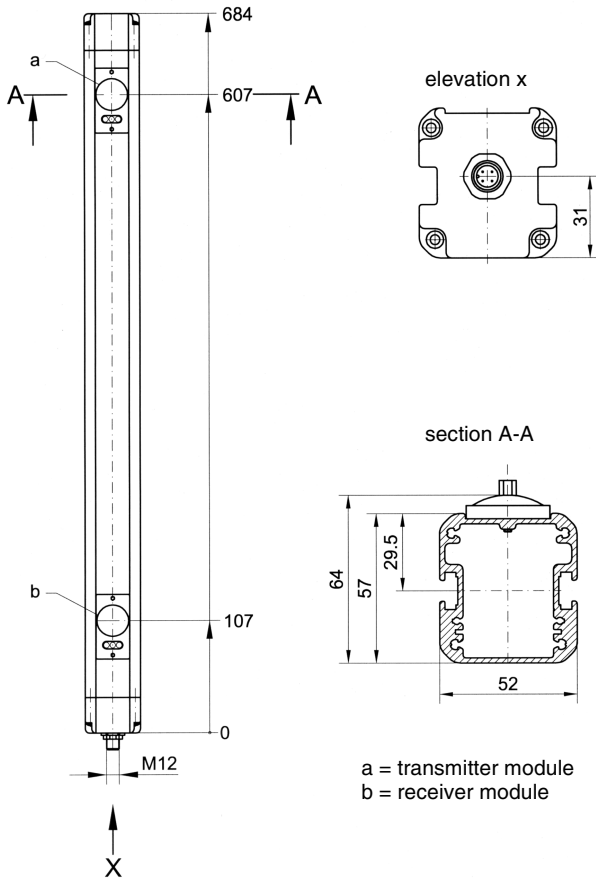
## 8 Technical Specifications and Dimensional Drawings

Safety classification	Type 4 in accordance to IEC 61496-1, -2 and EN 61496-1
Response time sensor (from interruption of protective field till switch-off command by way of AS-Interface)	RRT 42/A: 12 ms RRT 44/A: 12 ms
 Response time of system	max. 52 ms (12 ms ROBUST/AS-i + max. 40 ms AS-i safety monitor)
Enclosure rating	IP 67
Ambient temperature	-20° C...+55° C
Storage temperature	-30°C ...+70°C
Transmitter	light-emitting diodes as defined by EN 60825-1: 1994 + A1:2002 + A2:2001
Class	1
Wave length	880 nm
Pulse duration	39,2 µs
Pulse pause	273,3 µs
Output	159,3 µW
Optical parts	glass Ø 30 mm
Effective angle of radiation	from 3 m ≤ ± 2°
Lens heating system	integrated
Housing material	aluminium extruded profile
Colour / varnishing	yellow, RAL 1021 (lead-free and cadmium-free)
Housing / isolation class	protective class 2

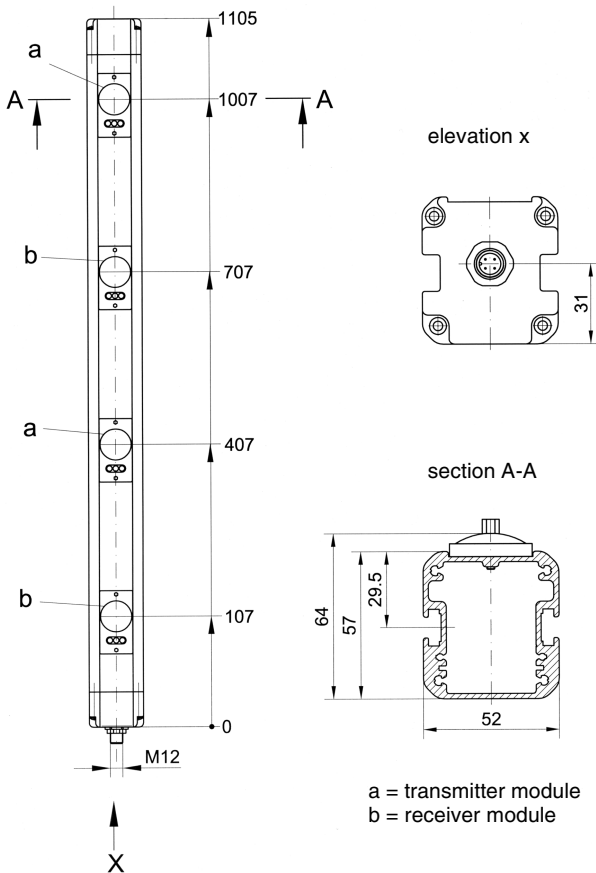
<b>AS-i specific data :</b>	
Power supply	AS-i (26.5..31.6V)
ID code	B
I/O code	0 (four bits as output)
Slave address	programmed by the user in the range 1 to 31 (factory default: bus address = „0“)
Cycle time in keeping with AS-i specifications	5 ms
AS-i profile	safe slave
Electrical connection	M12 plug: pin 1 = ASI+, pin 3 = ASI-
Operating mode	guard mode without restart interlock

<b>ROBUST 42/AS-i</b>	
Distance between beams (2 beams)	500 mm
Max. range	0,5 m - 2,5 m with PM2-500 passive deflecting mirror 1,5 m - 8 m with PM2-500V passive deflecting mirror
Current consumption	160 mA
Weight	900 g

<b>ROBUST 44/AS-i</b>	
Distance between beams (4 beams)	300 mm
Max. range	0,5 m - 2,5 m with PM4-300, passive deflecting mirror 1,5 m - 8 m with PM4-300V, passive deflecting mirror
Current consumption	300 mA
Weight	1800 g



**Fig. 8-1:** Dimensional drawing: ROBUST 42/AS-i (Transceiver)



**Fig. 8-2:** Dimensional drawing: ROBUST 44/AS-i (Transceiver)

## 9 Selection and Notes on Ordering

Article specification	Description	Order no.
ROBUST 42/AS-i		
RRT42/A	Transceiver with M12 connector plug	580010
PM2-500	Passive deflecting mirror for 2 light beams with 0,5 m - 2,5 m range	50029088
PM2-500V	Passive deflecting mirror for 2 light beams with 1,5 m - 8 m range	909661
ROBUST 44/AS-i		

Article specification	Description	Order no.
RRT 44/A	Transceiver with M12 connector plug	580011
PM4-300	Passive deflecting mirror for 4 light beams with 0,5 m - 2,5 m range	50029570
PM4-300V	Passive deflecting mirror for 4 light beams with 1,5 m - 8 m range	909663

### ROBUST accessories



See, in this connection, Chapter 7 of the Connecting and Operating Instructions for ROBUST 42,43,44.

### AS-i Safety accessories

Article specification	Description	Order no.
APG-02	AS-i programming device for entry of standard/A/B addresses of AS-i slaves	580003
AM06	M12 AS-i bus terminal for AS-i cable	50024346
AKB 01	AS-i cable (1 unit per metre)	50024750
KB-095-1000-3AW	M12 connection lead (1 m, axial/angled)	50024748
KB-095-2000-3AW	M12 connection lead (2 m, axial/angled)	50024749
KB-095-5000-3AW	M12 connection lead (5 m, axial/angled)	50081151

### AS-i safety monitor ASM1

Article specification	Description	Order no.
ASM1/1	AS-i safety monitor, 1 OSSD	580020
ASM1/2	AS-i safety monitor, 2 OSSDs	580021
<b>Accessories</b>		
ASM1-SWC	ASM1 installation set with software, Connecting and Operating Instructions, asimon software users' manual, programming cable and device replacement data cable	580032
ASM1-PK	ASM1 programming cable	580030
ASM1-DK	ASM1 device replacement data cable	580031
ASM1-TM	Manual: Connecting and Operating Instructions	607020
ASM1-SM	Manual: asimon configuration and diagnosis software	607030



## Leuze lumiflex

### EC Declaration of Conformity

according to EC Machinery Directive 98/37/EC, Annex II C

We herewith declare, Leuze lumiflex GmbH + Co. KG  
Liebigstraße 4  
D-82256 Fürstenfeldbruck, Germany

that the following described protective device complies with the appropriate EC Directive(s) based on its design and type as brought into circulation by us. In case of alternations of the protective device, not agreed upon by us, this declaration will lose its validity.

Description of the safety component: **Multiple Light Beam Safety Device with integrated AS-i interface**

Safety component Type: **ROBUST 42/AS-i**  
Consisting of: **Transceiver RRT 42/A**  
Serial number: see type plate  
Safety type: AOPD type 4  
Safety function: Active Opto-electronic Protective Device

Applicable directives and standards: EC Machinery Directive (98/37/EC)  
EMC Directive (89/336/EEC)  
EC Low Voltage Directive (73/23/EEC)

Employed standards: EN 292-1,-2: 1991  
DIN EN 954-1: 1997  
EN 61496-1: 1998  
prEN 50100, T.2, Aug.94  
EN 55022: 1998  
EN 61000-6-2: 1999  
EN 50178: 1997  
EN 60204-1: 1997  
EN 50295: 1999  
EN 60825-1: 1994+A1: 2002+A2:2001

Notified body according to annex VII: TÜV NORD  
Am TÜV 1  
D-30519 Hannover, Germany

Comissioned: EC - type examination  
Examination certificate no. **08/205/B1-YMA129135**

CE-marking: The compliance with the directives 73/23/EEC and 89/336/EEC is certified by the CE-mark.

Fürstenfeldbruck, August 2005

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Director product unit Safety at work

ppa. Werner Lehner  
Director product management



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Ampergasse, Kirchheim/Teck HRB 550  
Geschäftsführer: Dr. Harald Grabel, Michael Heyne



## EC Declaration of Conformity

according to EC Machinery Directive 98/37/EC, Annex II C

We herewith declare, **Leuze lumiflex GmbH + Co. KG**  
Liebigstraße 4  
D-82256 Fürstenfeldbruck, Germany

that the following described protective device complies with the appropriate EC Directive(s) based on its design and type as brought into circulation by us. In case of alternations of the protective device, not agreed upon by us, this declaration will lose its validity.

Description of the safety component: **Multiple Light Beam Safety Device with integrated AS-i interface**

Safety component Type: **ROBUST 44/AS-i**  
Consisting of: **Transceiver RRT 44/A**  
Serial number: see type plate

Safety type: **AOPD type 4**

Safety function: **Active Opto-electronic Protective Device**

Applicable directives and standards: **EC Machinery Directive (98/37/EC)**  
**EMC Directive (89/336/EEC)**  
**EC Low Voltage Directive (73/23/EEC)**

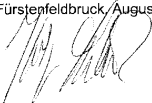
Employed standards:	EN 292-1,-2:	1991
	DIN EN 954-1:	1997
	EN 61496-1:	1998
	IEC 61496-2:	1997
	EN 55022:	1998
	EN 61000-6-2:	1999
	EN 50178:	1997
	EN 60204-1:	1997
	EN 50295:	1999
	EN 60825-1:	1994+A1: 2002+A2:2001


Notified body according to annex VII: **TÜV NORD**  
**Am TÜV 1**  
**D-30519 Hannover, Germany**

Comissioned: **EC - type examination**  
**Examination certificate no. 08/205/B1-YMA186236**

CE-marking: **The compliance with the directives 73/23/EEC and 89/336/EEC is certified by the CE-mark.**

Fürstenfeldbruck, August 2005

  
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