BRS
BRIGHT RED SYSTEMS GMBH

FEATURES

- Innovative 2D edge position measurement
- Accuracy in X- und Y-direction up to ±0.05 mm
- 3D modelling of warped and thin wafers
- *GLASS EDGE* – glass edge detection
- Independend of material surface reflections
- High sampling rate up to 1 kS/s
- CCD sensor with up to 45 mm active sensing length for 12", 8" - 6" sowie 6" - 4" wafer
- 2 x 4-20 mA, oder 2 x 0-10 V interface
- Easy-to-use RS-232 serial interface
- Trigger input for synchronisation

RED EG

2D | **GLASS EDGE** | **1 kS/s**

OPERATION

A **Ranging Edge Detector (RE-Detector, RED)** enables two-dimensional edge position measurement of various objects in X- and Y-direction, which opens new applications in quality assurance and control, and in optical position measurement. With its innovative exposure technique the RE-Detector is predominantly used in the semiconductor industry for wafer pre-alignment of warped and thin wafers as well as transparent wafer substrates.

PRINCIPLE

RE-Detectors basically consist of a CCD sensor, a separate and oppositely positioned laser exposure unit and the embedded signal processing, which performs calculation of the two-dimensional position data. The arbitrarily scalable exposure system of an RE-Detector consists of at least two laser sources. This allows computation of the edge position not only horizontally (X-coordinate), but also the vertical distance (Y-coordinate) to the CCD sensor can be calculated.
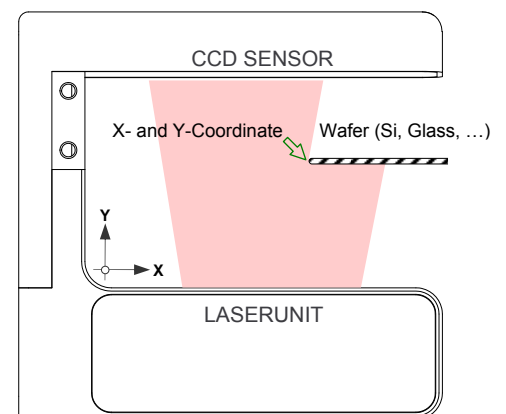
Figure 1 – Ranging Edge Detector

Figure 1 illustrates e.g. the two-dimensionally measured wafer edge. Using special multi-laser exposure, also edges of transparent objects such as glass can be captured, enabling also thickness measurements of transparent and non-transparent materials.

TECHNICAL DATA

Measurement Data	RED G2	RED EG	Note
Sensor fork, height / width	50 x 101 mm	32 x 54 mm	various models o. r. [1] [2]
Active area, Y / X	50 x 30 mm	14 x 35 mm	minimum dimension [2]
Accuracy	±0.05 mm	±0.2 mm	in X- and Y-direction
Light source	Laser	Laser	multi-laser modul, class 1M
Wavelength	780 nm	780 nm	

Time Response	RED G2	RED EG	Note
Sampling rate	max. 1 kS/s	max. 1 kS/s	
Response time	max. 1 ms	max. 1 ms	triggered 2D-measurement [3]

Interfaces	RED G2	RED EG	Note
Input impedance	10 kΩ ±10%	10 kΩ ±10%	Trigger / Teach-input
Output current PNP channels	max. 20 mA	-	Digital switch output D [4]
Current loop interface C1, analog	0 … 20 mA	-	Current loop interface C1 [5], $R_L \leq 500\ \Omega$
Current loop interface C2, analog	4 … 20 mA	-	Current loop interface C2 [5], $R_L \leq 500\ \Omega$
Voltage interface V, analog	0 … 10 V	-	Voltage interface V, $R_L \geq 1k\Omega$
Data interface, serial	RS232/RS485	RS232	921.6 kbit/s max.

Mechanical Data	RED G2	RED EG	Note
Body	Aluminium	Aluminium	black anodised
Dimensions, height / width	108 x 125 mm	62 x 64 mm	dimensions [1]
Dimension, depth	24 mm	18 mm	
Weight	280 g	125 g	
Optical window	IR filter (Acrylic)	IR filter (Acrylic)	Infrared filter o. r. [1]

Operation	RED G2	RED EG	Note
Voltage supply	12 V – 30 V	5 V ±10%	power: 3W max.
Protection	1, 2, 3	1, 2, 3	Protection type [6]
Storage- and operating temperature	0 ° C … 50 ° C	0 ° C … 50 ° C	
Protection class	IP 50	IP 50	
Standards	EN 60825	EN 60825	Safety with lasers
	EN 61010	EN 61010	Safety regulations for el. measurement- and control circuits

1) o. r.: Individual solutions and specifications on special request
2) Explanation see pages 3, 4
3) If triggered via RS232/RS485 data interface, additional delay of command transmission
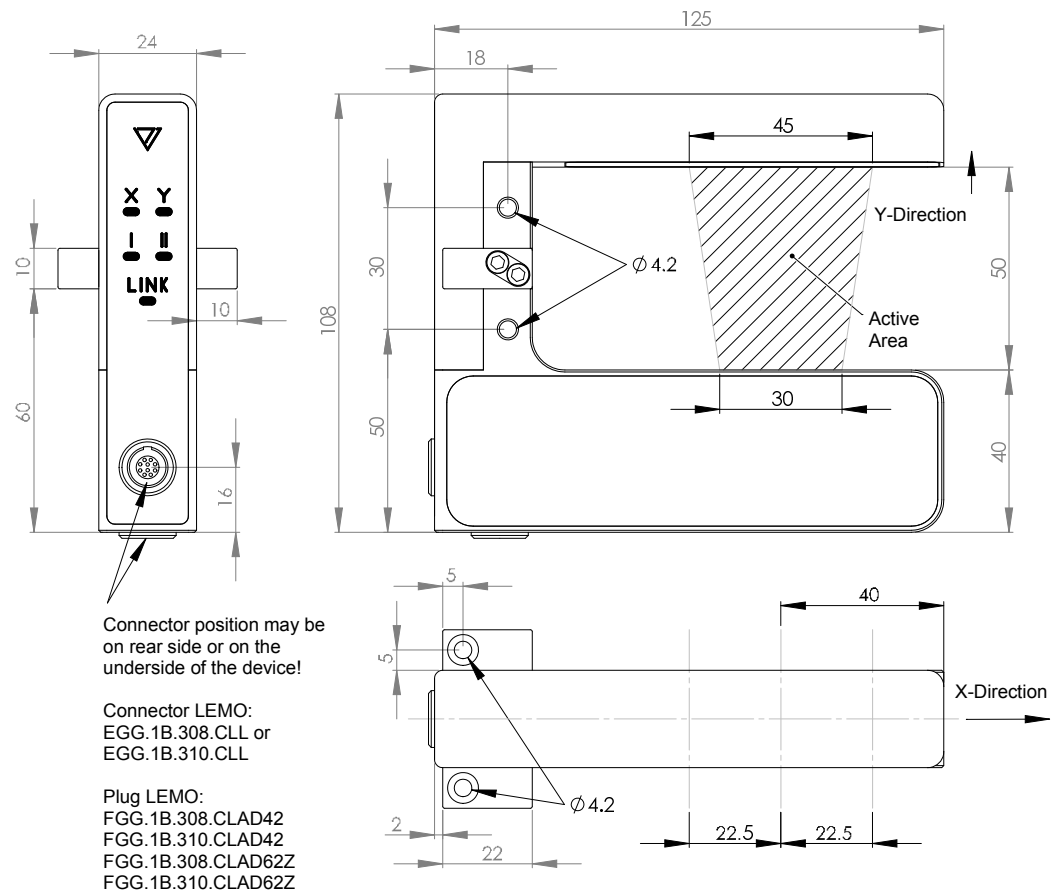4) Digital switch output, selectable light- or dark switching
5) Interface configuration selectable between C1 and C2
6) 1 = surge protected, 2 = reverse voltage protected, 3 = short circuit protected for all output ports
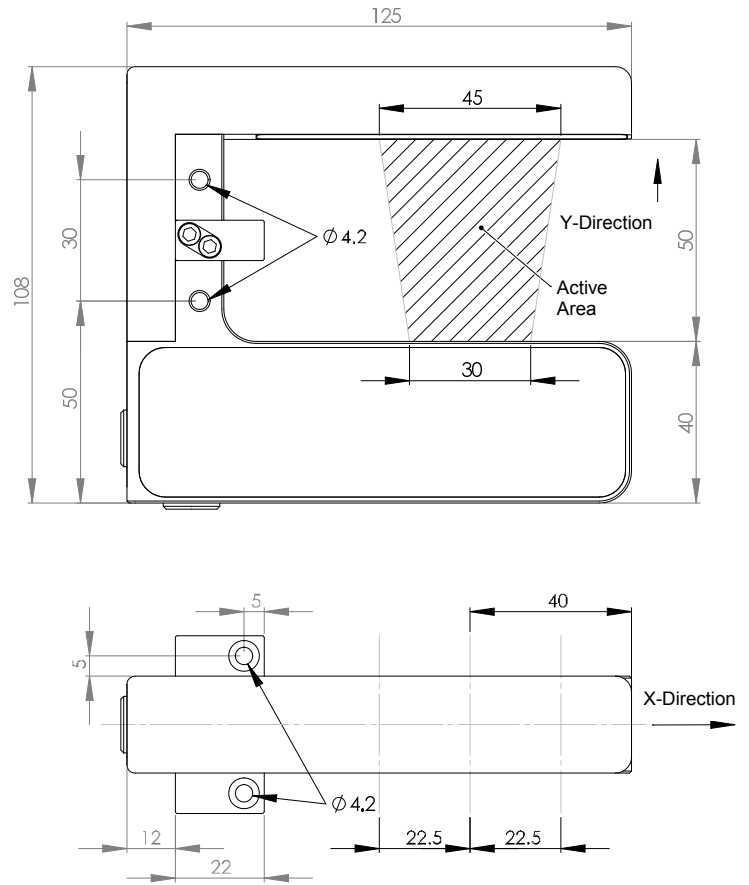
BRS

RE-DETECTOR MODELS

Selection Chart		G2 C 232 C P	G2 V 232 C P	G2 D 232 C P	G2 C 485 C P	G2 V 485 C P	G2 D 485 C P	EG 232 305 U
Interfaces	2 x Current loop interface C (C1 or C2)	●			●			
	2 x Voltage interface V		●			●		
	2 x Digital switch output D			●			●	
	1 x RS232	●	●	●				●
	1 x RS485				●	●	●	
IR Filter	Acrylic	●	●	●	●	●	●	●
	Glass (on request)							
Accessories	User manual	●	●	●	●	●	●	●
	Serial cable							
	24 V power supply with data ports							
	PC software							

RE-DETECTOR RED-G2 MOUNTING EXAMPLE 1

Connector position may be on rear side or on the underside of the device!

Connector LEMO:
EGG.1B.308.CLL or
EGG.1B.310.CLL

Plug LEMO:
FGG.1B.308.CLAD42
FGG.1B.310.CLAD42
FGG.1B.308.CLAD62Z
FGG.1B.310.CLAD62Z

RE-DETECTOR RED-G2 MOUNTING EXAMPLE 2

RED-EG

Connector LEMO:
EGG.0B.305.CLL

Plug LEMO:
FGG.0B.305.CLL
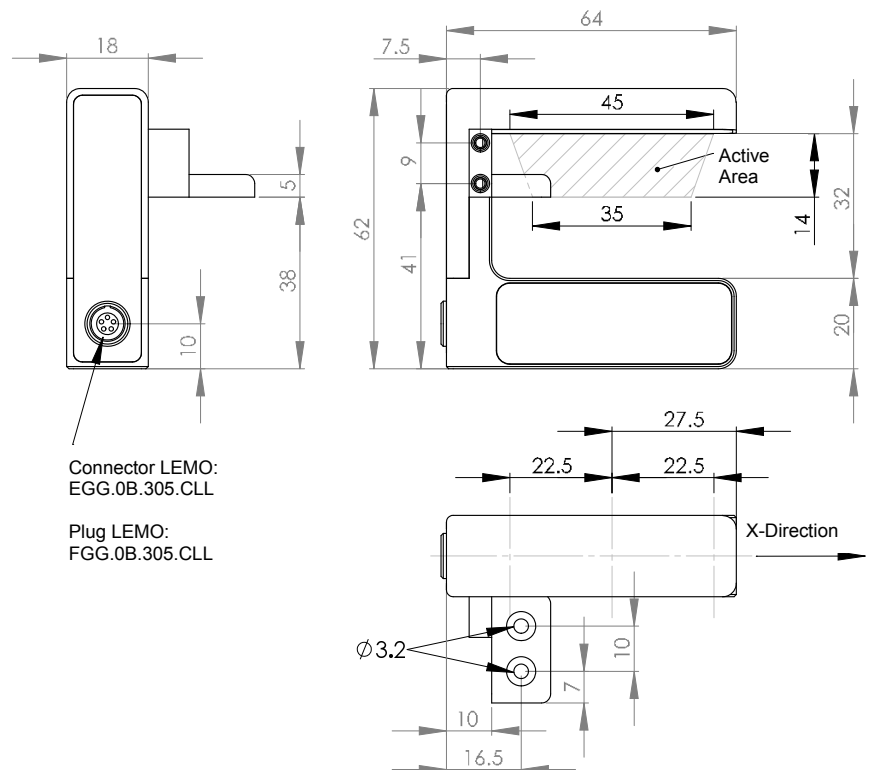
PIN CONFIGURATION
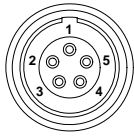
EGG.0B.305.CLL

Pin	EG 232 305 R
1	5 V
2	GND
3	TxD
4	RxD
5	**Trigger/Teach**, I/O [1]
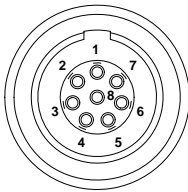
EGG.1B.308.CLL

Pin	G2 C/V/D 232 308 A
1	12 V – 30 V
2	GND
3	TxD
4	RxD
5	**Trigger/Teach [1]**, I/O [2]
6	Xout (C/V/D)
7	Yout (C/V/D)
8	Fault X/Y
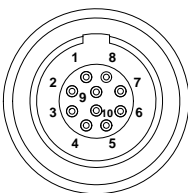
EGG.1B.310.CLL

Pin	G2 C/V/D 232 310 A	G2 C/V/D 485 A
1	12 V – 30 V	12 V – 30 V
2	GND	GND
3	TxD	TxD+
4	RxD	RxD+
5	**Trigger/Teach [1]**, I/O [2]	**Trigger/Teach [1]**, I/O [2], Fault X/XY [2]
6	Xout (C/V/D)	Xout (C/V/D)
7	Yout (C/V/D)	Yout (C/V/D)
8	Fault X	TxD-
9	Fault Y	RxD-
10	I/O	**I/O [1]**, Fault Y [2]
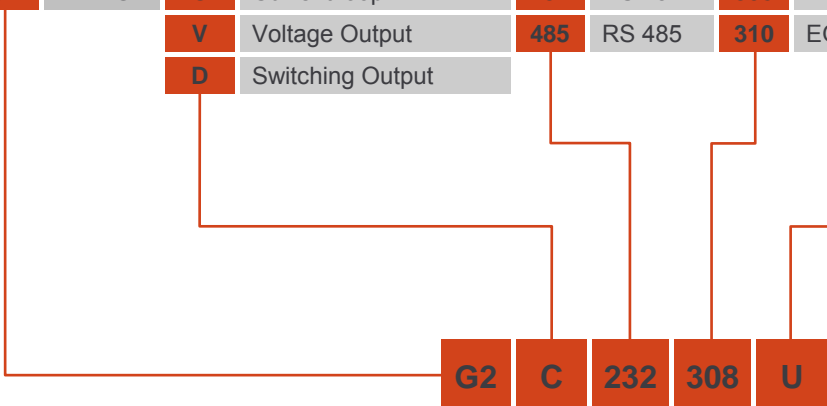
1) Factory setting
2) alternative funktion user-definable via RS232/RS485

Pin	Description	Pin	Description
GND	Ground (Supply Voltage 0V)	**Trigger/Teach**	Trigger input for synchronization with origin teach function
TxD	Transmit Data	**I/O**	Digitaler Input/Output
RxD	Receive Data	**Xout**	Output X-Channel (C/V/D)
TxD+	Differential Transmit Data (positive)	**Yout**	Output Y-Channel (C/V/D)
TxD-	Differential Transmit Data (negative)	**Fault X**	Fault on X-Channel
RxD+	Differential Receive Data (positive)	**Fault Y**	Fault on Y-Channel
RxD-	Differential Receive Data (negative)	**Fault X/XY**	Fault on X-Channel or. XY-Channel

BRS
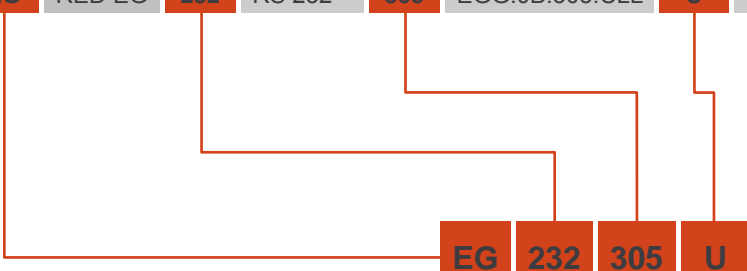
RED G2 ORDER CODE

M	Modell	O	Output	I	Interface	C	Connector	P	Position
G2	RED G2	C	Current loop	232	RS 232	308	EGG.1B.308.CLL	U	Underside
		V	Voltage Output	485	RS 485	310	EGG.1B.310.CLL	R	Rear side
		D	Switching Output						

G2	C	232	308	U

RED EG ORDER CODE

M	Modell	I	Interface	C	Connector	P	Position
EG	RED EG	232	RS 232	305	EGG.0B.305.CLL	U	Underside

EG	232	305	U

APPLICATIONS

- Optical wafer pre-alignment including recognition of cracked or chipped wafer edges
- Pre-alignment of transparent wafer substrates like sapphire (Al_2O_3), silicon carbide (SiC) or glass wafer
- 3D measuring of warped thin wafer creates 3D wafer models and enables wafer warpage measurement
- Adaptive thin wafer handling for wafer transport robots

OPTIONAL SERVICES

Individual cable lengths

Mobile servicekit with hard protective case

Customer specific firmware adaption

CONTACT

BRS - BRIGHT RED SYSTEMS GMBH

Plüddemanngasse 39, 8010 Graz, Austria

Tel: 0043 316 232 106 Fax: +10

Email: office@bright-red-systems.com

Web: www.bright-red-systems.com