

Breimo

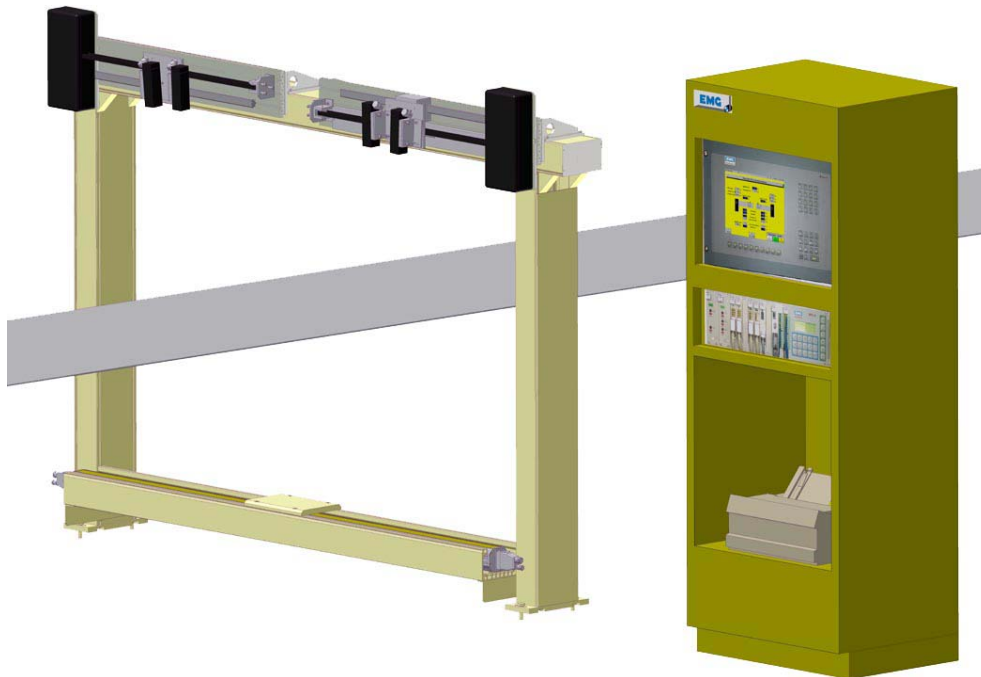
Continuous detection of strip width

Data Sheet

Function:	Continuous detection of strip width by means of optical sensor positioner devices type EVK2-CP
Mechanical design:	Measuring frame made of extruded aluminium profiles or welded steel construction
Measuring range:	400, 600, 800 ... 3000 mm
Measuring accuracy:	< $\pm 0,5$ mm (Allowed strip height fluctuations at measuring point: ± 10 mm)
Output resolution:	0,1 mm
Measuring frequency:	10 or 100Hz
Ambient temperature:	0 ...50° C
Weight:	Depending on size of frame and place of installation

Application

Progressing automation and growing importance of the product quality demand for a continuous monitoring of the strip width in Processing Lines.



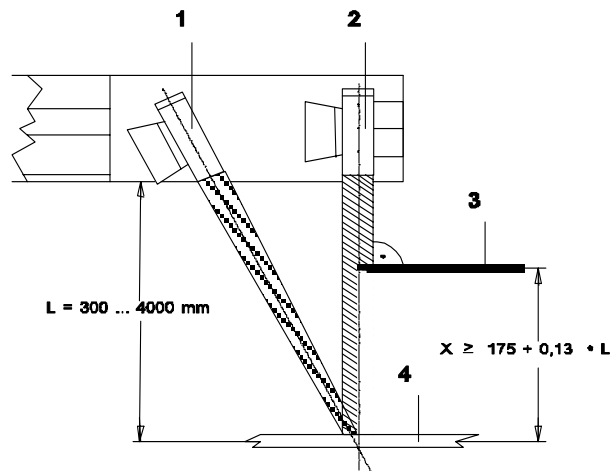
Measuring Principle

The strip width measurement developed by EMG uses components of the strip guiding equipment and consists of a contactless measuring arrangement and a computer aided signal processor.

Detection of the strip edge positions is carried out photoelectrically by motorized sensor positioners equipped with high frequency light receivers (impervious to ambient light). If displacements of the strip edges occur due to strip width changes or strip wander each measuring arrangement follows its related strip edge in a closed loop position control.

The working strokes of the two sensor positioners are continuously measured and transmitted to the computer by a digital resolver. The difference in positions represents the strip width. Transient deviations of the strip edges from the centre of the edge sensors during movement are also transmitted to the computer for the calculation of the strip width. This ensures that the true strip width is measured under any working condition.

Contaminations of the light transmitters are compensated by the reference principle using a measuring sensor and a reference sensor both of which are directed to the same area in the light transmitter. Whilst the measuring sensor measures the lateral displacement of the strip edge the reference sensor monitors the brightness of the light transmitter.



Arrangement of High frequency Measuring and reference sensor at the sensor positioner device

- | | |
|-----------------------------|---|
| 1 Reference photo cell LS14 | 3 Metal strip |
| 2 Measuring photo cell LS13 | 4 HF-light unit (LIH.../ LIH2...../ LIC...) |

The elimination of disturbances by ambient light via the use of high frequency light transmitters and selective receivers is of high importance to the accuracy of the width measurement. The intensity of the emitted radiation is controlled by an electronic circuit. Additionally the transmitters are monitored for defects.

The standard parameterization of the installation is made by means of an integrated keyboard and display unit inside the universal micro controller.

Measuring arrangement

Attached to the frame above the strip are two sensor positioners with motorized slides. Each slide is equipped with a high frequency alternating light measuring unit comprising a measuring receiver and a reference receiver. On the frame there is also a contactless linear stroke transducer that is activated by magnets on the slides. Below the strip the frame houses two light transmitters that are high frequency energized. The supply for the sensor positioners and the light transmitters as well as the evaluation electronics are located in a steel enclosure at the side of the frame.

The total measuring frame is completely assembled, wired and adjusted ready for use.

Universal-MicroController

The 19"-PCB-Computer is housed in a separate steel enclosure together with its power supply and the evaluation electronics for the stroke transducer. Based on the measuring values of the high frequency alternating light receivers and on the digital readings of the linear stroke transducer it calculates the strip width and transfers it to the interfaces. The computer also monitors the status and the fault signals of the total system.

Electrical Interface

The data can be supplied BCD-coded or as serial interface:

1. BCD-Interface (parallel)

18 lines "strip width" in 10th of a mm
0000,0 ... 3999,9
1 line "data valid"
1 line "reading taken"

2. V24/TTY-serial interface

Message form : 1 Start-bit; 7 data-bit; 1 parity-bit; 1 stop-bit
Transmitted length : 7 character (70 bit)
Report : STX, Strip width (5 digits), ETX
Baud-rate : 1200 bit/sec.

3. 3964R – Report (not compatible to Siemens-S5)

Message form : 1 Start-bit; 8 data-bit; 1 parity-bit (even); 1 stop-bit
Transmitted length : 7 character (70 bit)
Report : STX, Strip width (5 digits), ETX
Baud-rate : 1200 bit/sec.

4. Ethernet TCP/IP

Report : Modbus /TCP
Baud-rate : 10 Mbit/sec.

5. Profibus L2DP-Slave

Report : Strip width in 0,1mm , transmittal in data word 0

Options

Option 1

Permanent visualization and parameterization by means of an industrial computer integrated in the computer housing.

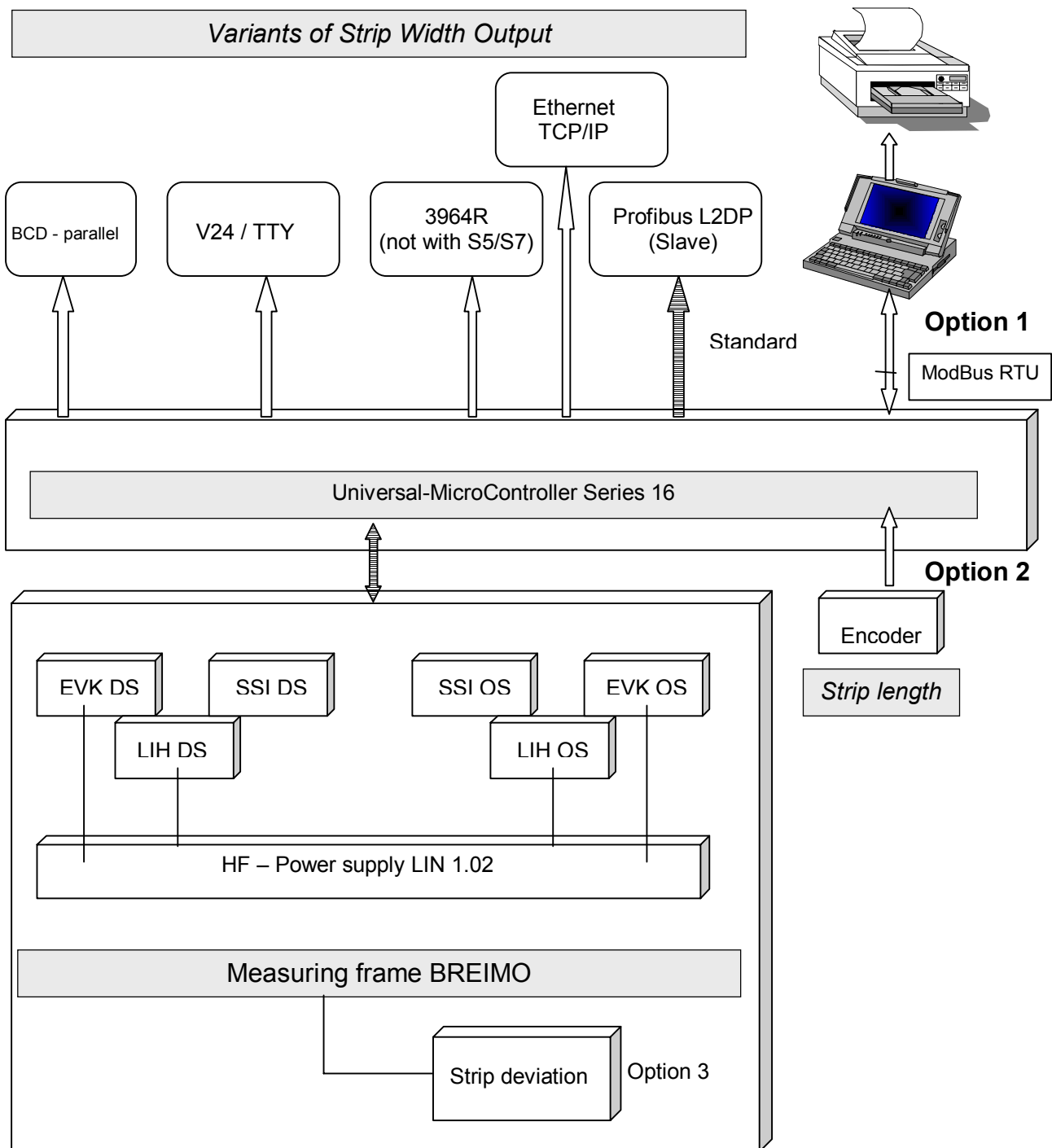
Option 2 Tooling-up to a quality logging system

- Industrial computer according to option 1
- Strip length detection by means of pulse generator
- Correspondence between the width variations and running strip length (up to 600 mm/min per running meter – above that in larger steps)
- Print of a quality log for each coil by means of customer's matrix printer with serialinterface.

Option 3 Combination of strip width measurement with strip center guiding system

The deviation of strip from the center of installation will be output as analog signal 0 ... $\pm 10V$.
The options 1 and 2 are possible in addition.

Block Diagram



Required Data for Quotation:

Purpose and place of strip width measurement:	
Strip material	
Strip width range min/max	in mm
Speed of lateral strip wander	in mm/sec.
Max. lateral strip wander	in mm
Strip pass line above foundation	in mm
Ambient temperature	°C
Requested interface	