BrandTronik DMM

Processor based, modular structured, hybrid multi-channel measuring system for transducers in strain-gauge technics.
Configurable in hard- and software equipment

- Process field bus modules
- Binary inputs
- Analog in- and outputs
- Ready for calibration
- Clip-on box in acc. to DIN EN 60715 TH 35, extend able by hermetic closed field boxes IP55.

Purpose

Supply of strain gage bridges and conditioning of their output signals in industrial production lines. Parameter setting for the measuring position.
Measuring of calibrated dimensions, like mass, force, pressure; further output of computed secondary dimensions, like metal strip tension, rope tension, milling force.
Bidirectional communication to PLC via process field bus interface.
Computing of the measured dimensions under enclosure of measuring point parameters and variables from process by standard and/or application specific software.
Simultaneous, scaled analog output of the measured resp. computed dimension in addition.

Operation

The reference voltage which feeds the connected strain gage bridge is controlled by the processor and set-up under consideration of transducer and measuring position parameters individually.
The bridge output voltage $U_{meas.}$ will be compensated in it's offset.
The ADC in front of the processor receives only the effective measuring signal, effecting full bandwidth.
The digital converted sensor signal is now compute by a measuring point specific algorithm and output numerical and/or analog, either as direct dimension given by the transducer or indirect as calculated dimension, e. g. „strip tension“.
During measuring process appearing process variables can be transferred via the processbus interface to the DMM-processor, with the purpose, to calculate their influence to the measurement and correct it.
Process variables, which reducing or increasing the measuring force (e. g. varying wrap angles of deflector rolls before coil-stations), will not effect the output dimension through control of the amplification as function of the geometric situation.
Safeness in data transit to the PLC is given by the Profibus (or other process field bus standards).
Additional 4 binary inputs are available, usable as status inputs (e. g. to indicate positions of diver- or swivel rolls).
The parameter set-up of the application specific software can be made via serial interface from notebook or without external equipment too, using 3 push buttons and DOT-Matrix display for stepwise set-up.
In CAL-mode the signal path from sensor to output can be checked in set-up and function without physical load.
The nominal value of the dimension specified (measuring force direct, strip tension from measuring force; hydraulic pressure direct, milling force from hydraulic pressure; mass direct, mass from hydraulic pressure, etc.) will be output with reference to a transducer specific Calibration-Normal considering it's parameters and those of the measuring position.

Basic design features

Electronic encapsuled in a clip-on housing (DIN EN 60715 TH 35) for mounting rails,
outline dimensions W x H x D = 105 x 130 x 70 mm³.
Ambient temperatur range (allowed) 0...+55° C.
Connector terminal for transducers and 24 VDC power supply; process field bus and serial input plug connector, frontpanel with three foil push buttons and backlighted DOT-Matrix display.

Inputs:	2 (for strain gage Wheatstone bridges 350...2000 Š) 4 binary („1“ = 24 VDC)
Outputs:	2 analog 0…10 V, 12 Bit solution, not galvanic isolated 2 strain gage supply voltages, 1…20 VDC separate adjustable.
Interface:	Profibus DP, 1.5 Mbaud or 12 Mbaud; transit rate 60/sec
Supply	24 VDC, 80 VA consumption

Configuration

Please select in the following list of attributes 1)...13) one characteristic per position.
Attribute

1) „Number of measuring channels“
1 = 2 measuring channels 2 = 4 measuring channels

2) „Typ of input signal channels 1...4“
0 = none 1 = 0.25 mV/V 2 = 0.5 mV/V
3 = 1.00 mV/V 4 = 2.00 mV/V
5 = 0...10 V 6 = 0...20 mA 7 = 4...20 mA

3) „Number of input signal paths, protected by zenerbarrier blocks“ (from transducers Ex II 2G EEx ia IIC T4 or Ex I M2 EEx ia I, placed in explosive danger area).
0 = none 1 = 1*5 zenerbarriers
2 = 2*5 zenerbarriers 3 = 3*5 zenerbarriers
4 = 4*5 zenerbarriers 5 = others

4) „Galvanic isolated analog output channels“
0 = none 1 = 0...10 V 2 = 2...10 V
3 = 0...20 mA 4 = 4...20 mA

5) „Field bus module with specific software“
0 = none
1 = Profibus DP, 1.5 Mbaud or 12 Mbaud at 60/sec transitrate
2 = others

6) „Optical bus driver“
0 = none
1 = Siemens SIMATIC NET profibus OLM (Optical Link Module) 6 GK 1503-3CB00
2 = Siemens SIMATIC NET profibus OBT (Optical Bus Treiber) 6 GK-1500-3AA00

7) „Content (typical) of the input data string“
1 = tare command and/or release CAL mode
2 = as 1, addional variables, like coil diameter
3 = others

8) „Content (typical) of the output data string“
1 = standard occupation bytes 0...7
byte 0, 1: single measured value A
byte 2, 3: single measured value B
byte 4, 5: mean of n single mesured values A'
byte 6, 7: mean of n single mesured values B'
2 = others

9) „Dimension output“
1 = strip/band tension in kN
2 = strip/band tension in N
3 = torque in kN 4 = torque in N
5 = measuring force in kN 6 = measuring force in N
7 = mass in tons 8 = mass in kg
8 = pressure in bar 10 = others

10) „Software equipment“
0 = standard software for a measuring position with constant parameters
1 = application specific software refering separate definition of the measuring position

11) „Power supply“
0 = 24 VDC/80 VA power consumption
1 = 110...240 VAC/50...60 Hz/100 VA power consumption

12) „Typ of housing“
0 = base unit with 2 measuring channels, build in one clip-on housing for mounting rails. Protection class IP 20.
Dimensions W*H*D = 105*130*70 mm²
(refer drawing no. M 35 050 00).

1 = extended base unit with 2 + 2 measuring channels, build in two clip-on housings for mounting rails. Protection class IP 20.
Dimens.: 2 * W*H*D = 2 * 105*130*70 mm³
(refer drawings no.: M 35 050 00; M 35 050 01)

2) = steel sheet housing for a 2-channel unit, colour varnish coated, protection class IP 55.
Dimens.: W*H*D = 330* 230* 155 mm³

3) = stainless steel sheet housing for a 2-channel unit, protection class IP 55.
Dimens.: W*H*D = 300*300*167 mm³

4 = steel sheet housing for a 2 + 2-channel unit, colour varnish coated, protection class IP 55.
Dimens.: W*H*D = 500*500*210 mm³

5 = stainless steel sheet housing for a 2 + 2-channel unit, protection class IP 55.
Dimens.: W*H*D = 380*380*167 mm³
Dimens.: W*H*D = 500*500*210 mm³

6 = other housings or cabinets

13) „Varnish coating“
0 = none
1 = RAL 7035 light-grey (standard)
2 = RAL xxxx coating no. to be defined