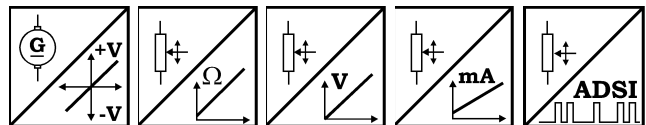


(W)GS2 Velocity Sensor with Analog or A/D converted synchronous serial output



Velocity Sensor with Position Option

- Protection Class IP50
- Measurement Range:
0 ... 1500 mm to 0 ... 2500 mm
0 ... 59.06 in to 0 ... 98.43 in
- With Analog Output or
A/D converted synchronous serial output



| Specifications | Outputs | Scaled / unscaled DC Tachometer Potentiometer: 1 kΩ Voltage: 0...10 V Current: 4 ... 20 mA, 2 or 3 wire Voltage and Current Output, adjustable A/D converted synchronous serial 12 Bit RS-485 |
|----------------|----------------------------|--|
| | Resolution | Essentially infinite / ADSI: 12 Bit Full Scale |
| | Material | Aluminium and Stainless steel. Cable: Stainless Steel. Housing: Anticorrosive Sheet Steel |
| | Sensing Device | Precision Potentiometer |
| | Connector | Male Socket 8 pin DIN 45326 |
| | Position Linearity | Up to ±0.05 % Full Scale |
| | Velocity Linearity | Up to ±0.25 % Full Scale |
| | Protection Class (IEC 529) | IP50 |

Order Code (W)GS2

| | | | | | | | | | | | | | | | |
|----------------------------------|--|---|--|---|--|---|--|---|--|---|--|---|--|---|----|
| Model Name | (W)GS | - | | - | | - | | - | | - | | - | | - | D8 |
| Measurement Range (in mm) | 1500 / 2000 / 2500 | | | | | | | | | | | | | | |
| Position outputs | R1K = Potentiometer 1 kΩ (other Values on Request e.g. 500 Ω) 10V = with 0 ... 10 V Signal Conditioner 420A = with 4 ... 20 mA Signal Conditioner (2 wire) 420T = with 4 ... 20 mA Signal Conditioner (3 wire) PMU = with 0...10 V/4...20 mA Signal Conditioner, adjustable ADSI = with A/D converted synchronous serial output 12 Bit / RS-485 | | | | | | | | | | | | | | |
| Velocity outputs | TA = 10 V/m/s; 0.423 V/100in/min approx. (unscaled DC Tachometer Output) T5 = 5 V/m/s; 0.212 V/100in/min (scaled DC Tachometer Output) Scaled Signal Conditioner: V2 = ±2 mm/s = ±10VDC V10 = ±10 mm/s = ±10 VDC V25 = ±25 mm/s = ±10 VDC V50 = ±50 mm/s = ±10VDC V100 = ±100 mm/s = ±10 VDC V250 = ±250 mm/s = ±10 VDC | | | | | | | | | | | | | | |
| Linearity (Position) | L10 = ±0.10 % (L05 on request) L25 = ±0.25 % | | | | | | | | | | | | | | |
| DIN Connector | D8 = Connector 8 pin DIN 45326 | | | | | | | | | | | | | | |

Order Code Mating Connector (see accessories page 105)

WS-CONN-D8

Order Example: WGS2 - 2500 - 10V - V10 - L10 - D8

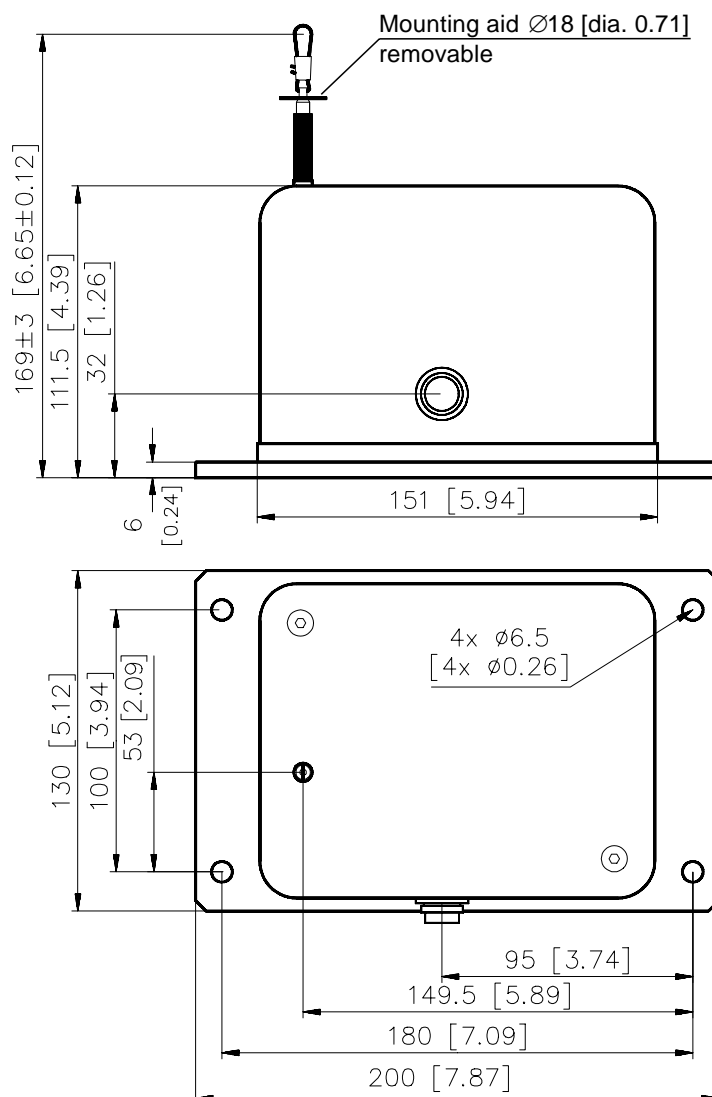
(W)GS2 Velocity Sensor with Analog or A/D converted synchronous serial output



| | | |
|---|--------------------------------|-------------------------------|
| Specifications (Continuation) | Weight | 2.1 kg approx. |
| | Environmental | |
| | Immunity to Interference (EMC) | Refer to Output Specification |
| | Temperature | Refer to Output Specification |

| Cable Forces typical at 20 °C | Range | | Maximum Pull-out Force | Minimum Pull-in Force |
|---|--------------|-------|-------------------------------|------------------------------|
| | [mm] | [in] | [N] | [N] |
| | 1500 | 59.06 | 10.2 | 6.7 |
| | 2000 | 78.74 | 8.4 | 5.4 |
| | 2500 | 98.43 | 7.2 | 4.8 |

Outline drawing



Dimensions in brackets are inches.
For guaranteed dimensions consult factory

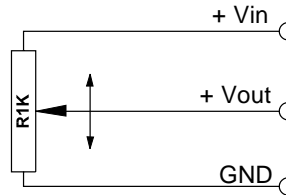
WS Position Sensors

Output Specifications R1K and 10V

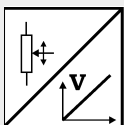


| | | |
|--|-----------------------------------|---|
| Voltage divider R1K Potentiometer  | Excitation Voltage | 32 VDC max. at 1 kΩ (Input Power 1 W max.) |
| | Potentiometer Impedance | 1 kΩ ±10% |
| | Thermal coefficient | ±0.0025% / K Full Scale |
| | Sensitivity | Depends on measurement range, individual sensitivity of sensor specified on label |
| | Voltage Divider Utilization Range | Approx. 3% ... 97% of Full Range |
| | Operating Temperature | -20 ... +85 °C |

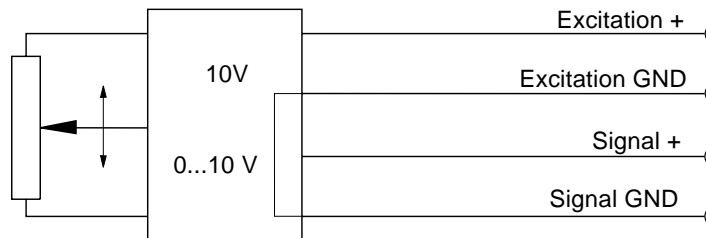
Signal diagram



Note: The potentiometer must be connected as a voltage divider. The input impedance of the following processing circuit should be 10 MΩ min.

| | | |
|---|--------------------------------|---|
| Signal conditioner 10V Voltage output  | Excitation Voltage | +18 ... +27 V DC non stabilized |
| | Excitation Current | 20 mA max. |
| | Output Voltage | 0 ... +10 V DC |
| | Output Current | 2 mA max. |
| | Output Load | > 5 kΩ |
| | Stability (Temperature) | ±0.005% / K Full Scale |
| | Protection | Reverse Polarity, Permanent Short Circuit |
| | Output Noise | 0,5 mVRMS |
| | Operating Temperature | -20 ... +85 °C |
| | Immunity to interference (EMC) | According to EN 61326: 1998 |

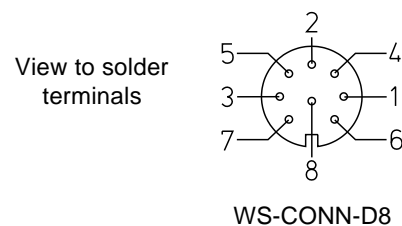
Signal diagram



| Signal Wiring | Output Signals | Connector | WS-CONN-D8 |
|---------------|----------------|----------------|------------|
| | R1K | 10V | |
| | + Vin | Excitation + | 1 |
| | GND | Excitation GND | 2 |
| | + Vout | Signal + | 3 |
| | | Signal GND | 4 |
| | | | 5 |
| | | | 6 |
| | | | 7 |
| | | | 8 |

Connection

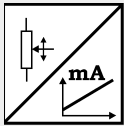
Mating Connector



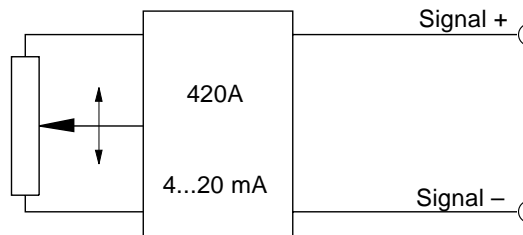
WS Position Sensors

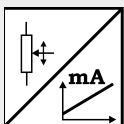
Output Specifications 420A and 420T



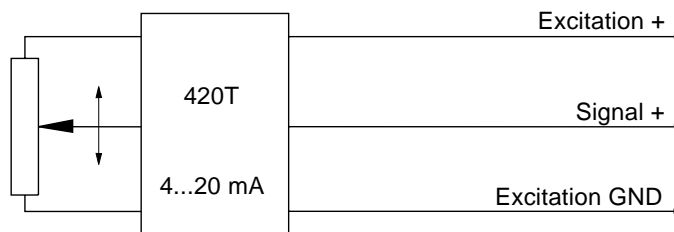
| | | |
|--|--------------------------------|---|
| Signal conditioner 420A Current output (2 wire)  | Excitation Voltage | +12 ... 27 VDC non stabilized, measured at the sensor terminals |
| | Excitation Current | 35 mA max. |
| | Output Current | 4 ... 20 mA equivalent to 0 ... 100% Range |
| | Stability(Temperature) | ±0.01% / K Full Scale |
| | Protection | Reverse Polarity, Permanent Short Circuit |
| | Output Noise | 0.5 mV _{RMS} |
| | Operating Temperature | -20 ... +85 °C |
| | Immunity to Interference (EMC) | According to EN 61326: 1998 |

Signal Diagram



| | | |
|--|-----------------------------|--|
| Signal Conditioner 420T Current output (3 wire)  | Excitation Voltage | +18...+27 V DC non stabilized |
| | Excitation Current | 40 mA max. |
| | Load Resistor | 350 Ω max. |
| | Output Current | 4 ... 20 mA equivalent to 0 ... 100% Range |
| | Stability (Temperature) | ±0.005% / K Full Scale |
| | Protection | Reverse Polarity, Permanent Short Circuit |
| | Output Noise | 0.5 mV _{RMS} |
| | Operating Temperature | -20 ... +85 °C |
| Immunity to Interference | According to EN 61326: 1998 | |

Signal diagram

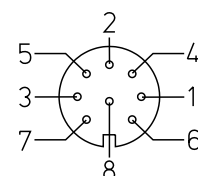


| Signal Wiring | Output Signals | | Connector |
|---------------|----------------|----------------|-----------|
| | 420A | 420T | |
| Signal + | Excitation + | Signal + | 1 |
| Signal - | Excitation GND | Excitation GND | 2 |
| | | Signal + | 3 |
| | | | 4 |
| | | | 5 |
| | | | 6 |
| | | | 7 |
| | | | 8 |

Connection

Mating Connector

View to solder terminals

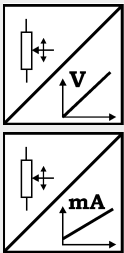


WS-CONN-D8

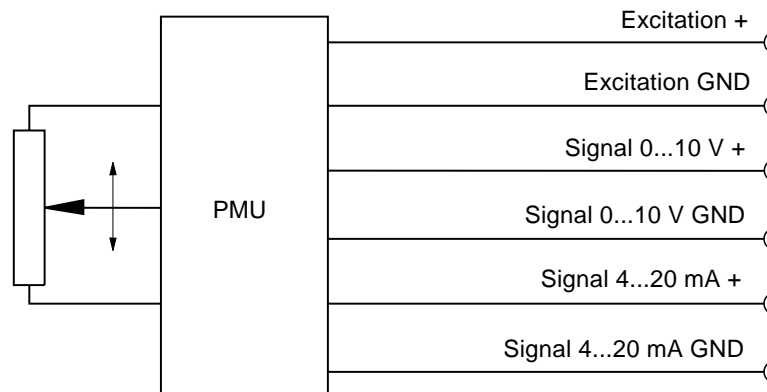
WS Position Sensors

Output Specification PMU



| | | |
|--|--------------------------------------|-----------------------------------|
| Signal Conditioner PMU, adjustable Voltage output and current output (3 wire)  | Excitation voltage | +18 ... 27 V DC |
| | Excitation current | 50 mA max. |
| | Voltage output | 0 ... 10 V |
| | Output current | 10 mA max. |
| | Output load | 1 kΩ min. |
| | Current output | 4 ... 20 mA (3 wire) |
| | Load resistor | 500 Ω max. |
| | Adjustment | |
| | Activation of offset and gain adjust | Connect with excitation GND (0 V) |
| | Scalable range | 90 % max. full scale |
| | Stability (Temperature) | ±50 ppm/°C full scale |
| | Protection | Reverse polarity, short circuit |
| | Output noise | 1 mV _{eff} |
| | Operating temperature | -20 ... +85 °C |
| EMC | | |
| Immunity to interference | EN 61000-4-2, -4, -5, -6 | |
| Influence according to EN 61000-4-6 | 1 % max. at testing strength 4 | |
| Emission of interference | CISPR 11 | |

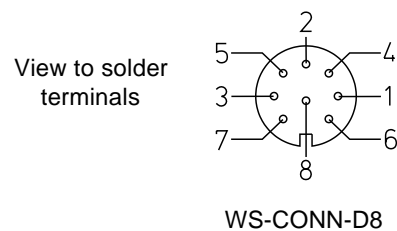
Signal diagram



| Signal wiring | Output signals PMU | Connector WS-CONN-D8 |
|---------------|----------------------|----------------------|
| | Excitation + | 1 |
| | Excitation GND | 2 |
| | Signal 0...10 V + | 3 |
| | Signal 0...10 V GND | 4 |
| | Signal 4...20 mA + | 5 |
| | Signal 4...20 mA GND | 6 |
| | Offset | 7 |
| | Gain | 8 |

Connection

Mating Connector



WS Position Sensors

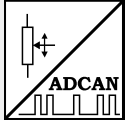
Output Specification ADCAN



Description

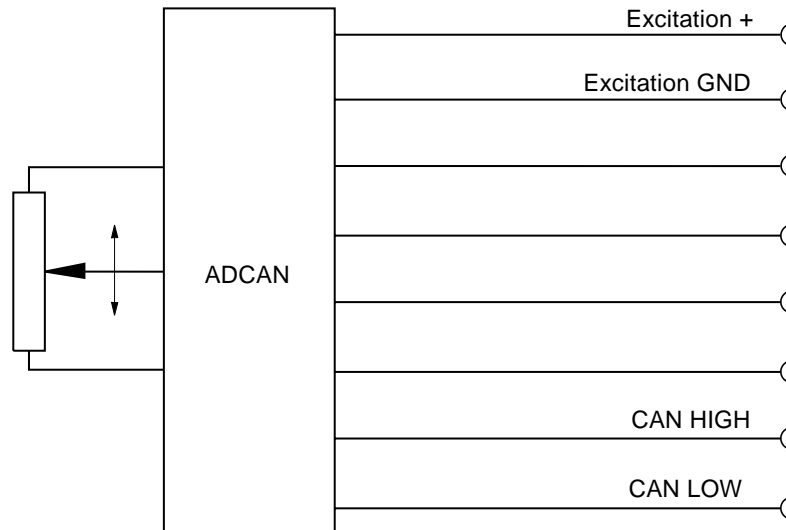
Signal conditioner with CANopen interface for WS Position Sensors and AWS Angle Sensors. The sensing device of the ADCAN is a precision potentiometer. Start, stop, synchronization of the position data transmission and parameter programming will be supported according to the CANopen standard DS301. Two process data objects (PDO) will be transmitted to transfer the position value and cam events.

Signal Conditioner ADCAN (CANopen)



| CANopen interface | |
|--------------------------------|--|
| Excitation Voltage | +24 V |
| Specifications | Communication Profile DS301 Encoder Profile DS406 |
| One Service Data Object (SDO) | Parameter setting |
| Two Process Data Objects (PDO) | Position value, cam |
| Transmission Rate | 125 kBd, variable by SDO |
| Node ID | Default 01, variable by SDO |
| Resolution | 16 Bit |
| Transmission mode | Synchronous, asynchronous cyclic or dependant on event |

Output signals

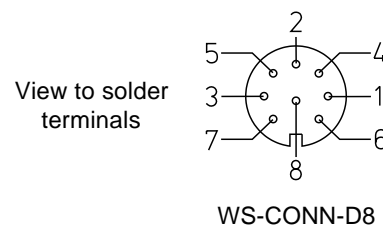


Signal wiring

| Signals ADCAN | Connector WS-CONN-D8 |
|------------------|----------------------|
| Excitation +24 V | 1 |
| Excitation GND | 2 |
| CAN LOW | 7 |
| CAN HIGH | 8 |

Connection

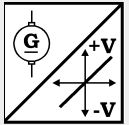
Mating connector



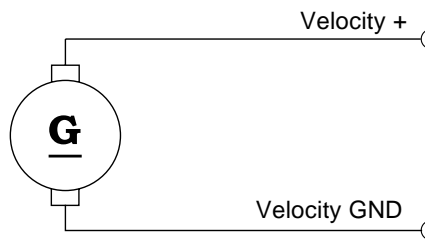
WS Position Sensors

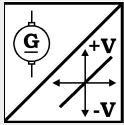
Output Specifications TA and T5



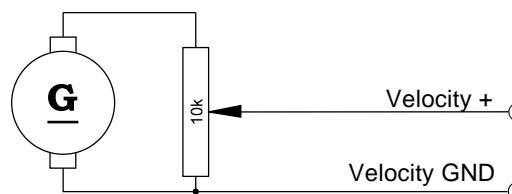
| | | |
|---|--------------------------------|---|
| Tacho TA Unscaled DC Tachometer  | Output Voltage | 100 VDC maximum permissible (self-generating) |
| | Output Load | > 100 kΩ |
| | Stability (Temperature) | ±0.02% / K Full Scale |
| | Output Impedance | 500 Ω approx. |
| | Sensitivity | 10 V/m/s approx., depends on the tachometer design: Individual measured sensitivity specified on label. |
| | Linearity | ±1% |
| | Operation Temperature | -20 ... +85 °C |
| | Immunity to Interference (EMC) | According to EN 61326: 1998 |

Signal Diagram



| | | |
|--|--------------------------------|--|
| Tacho T5 Scaled DC Tachometer  | Output voltage | 50 VDC maximum permissible (self-generating) |
| | Output Load | > 100 kΩ |
| | Stability (Temperature) | ±0.02% / K Full Scale |
| | Output Impedance | 500 Ω approx. |
| | Sensitivity | 5 V/m/s |
| | Linearity | ±1% |
| | Operation Temperature | -20 ... +85 °C |
| | Immunity to Interference (EMC) | According to EN 61326: 1998 |

Signal Diagram

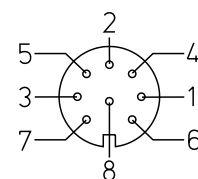


| Signal Wiring | Output Signals | Connector |
|---------------|----------------|-----------|
| | TA | T5 |
| | | 1 |
| | | 2 |
| | | 3 |
| | | 4 |
| | Velocity + | 5 |
| | Velocity GND | 6 |
| | | 7 |
| | | 8 |

Connection

Mating Connector

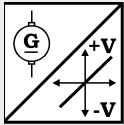
View to solder terminals



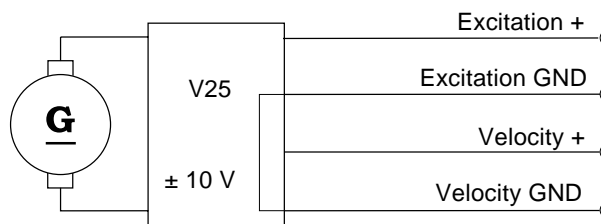
WS-CONN-D8

WS Position Sensor Output Specification VXXX



| | | |
|---|-----------------------------|--|
| Signal Conditioner VXXX Scaled DC Tachometer  | Excitation Voltage | +14 ... +27 VDC non stabilized |
| | Excitation Current | 20 mA max. |
| | Output Voltage | -10 ... +10 VDC |
| | Output Current | 1 mA max. |
| | Output Load | > 10 kΩ |
| | Stability (Temperature) | ±0.01% / K Full Scale |
| | Protection | Reverse Polarity, Permanent Short Circuit |
| | Output Noise | 0.5 mV _{RMS} |
| | Velocity Ranges | 2 / 10 / 25 / 50 / 100 / 250 mm/s |
| | Linearity | ±0.25% Full Scale, <100 mm/s: 1 % Full Scale |
| | Operating Temperature | -20 ... +85 °C |
| Immunity to interference (EMC) | According to EN 61326: 1998 | |

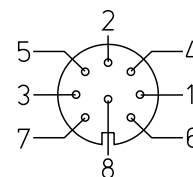
Signal Diagram



| Signal Wiring | Output Signals VXXX | Connector WS-CONN-D8 |
|---------------|------------------------|-------------------------|
| | Excitation + | 1 |
| | Excitation GND | 2 |
| | | 3 |
| | | 4 |
| | Velocity + | 5 |
| | Velocity GND | 6 |
| | | 7 |
| | | 8 |

Connection Mating Connector

View to solder
terminals



WS-CONN-D8

WS Position Sensors

Output Specification ADSI



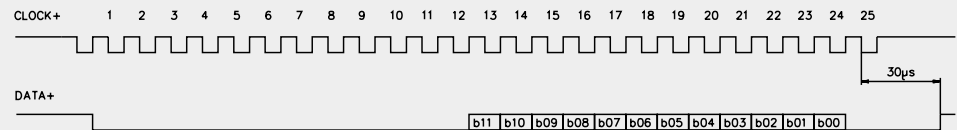
- Resolution 12 Bit, Data Transmission synchronous serial
- No Loss of Data at Power-down
- Easy to Connect to PLC's with SSI Input Circuit

Description

The sensing device of the ADSI is a precision potentiometer. The position information is given by an analog/digital converter output serialized as a data word. Data transmission takes place by means of the signals CLOCK and DATA. The processing unit (PLC, Micro-computer) sends pulse sequences which clock the data transmission with the required transfer rate. With the first falling edge of a pulse sequence the position of the sensor is recorded and stored. The following rising edges control the bit-by-bit A/D conversion, encoding and output of the data word.

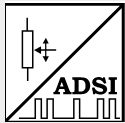
After a delay time the next new position information will be transmitted.

Data Format (Train of 26 Pulses)



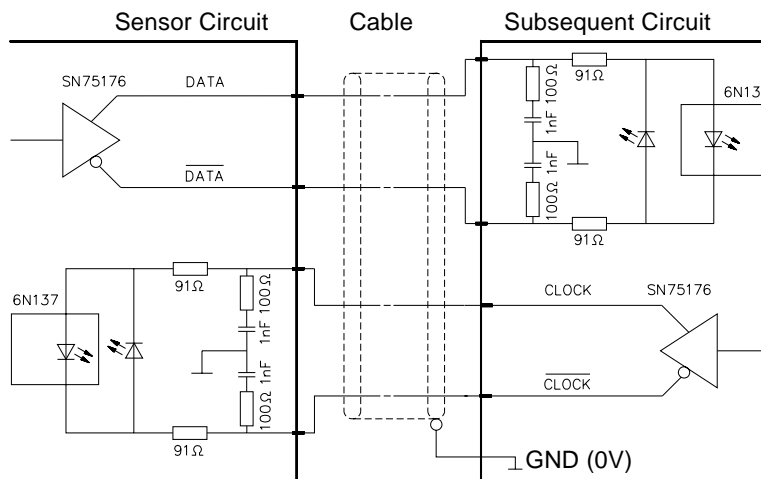
Signal Conditioner ADSI

A/D converted
synchronous serial



| | |
|--------------------------------|---|
| Output | EIA RS-422, RS-485, short-circuit proof |
| Excitation Voltage | 11 ... 27 VDC |
| Excitation Current | 200 mA max. |
| Clock Frequency | 70 ... 500 kHz |
| Code | Gray Code, Continuous Progression |
| Delay between Pulse Trains | T=30 µs min. |
| Resolution | 12 Bit (4096 Counts) Full Scale |
| Stability (Temperature) | ±0.005% / K Full Scale |
| Operation Temperature | -20 ... +85 °C |
| Immunity to Interference (EMC) | According to EN 61326: 1998 |

Recommended Processing Input Circuit



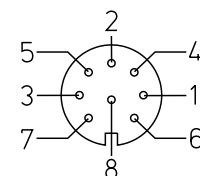
| Cable Length | Baud Rate |
|--------------|-----------|
| 50 m | 300 kHz |
| 200 m | 100 kHz |

Note:

Extension of the cable length will reduce the maximum transmission rate. The signals CLOCK/CLOCK and DATA/DATA must be connected in a twisted pair cable, shielded per pair and common.

Signal Wiring / Connection

| Signal name | Connector Pin |
|---------------------|---------------|
| Excitation + | 1 |
| Excitation GND (0V) | 2 |
| CLOCK | 3 |
| CLOCK | 4 |
| DATA | 5 |
| DATA | 6 |
| Screen | not connected |



Mating Connector
View to solder terminals

WS-CONN-D8