



DIGITAL INCLINOMETER NG360

RS485 Communication
360 degree working range

FEATURES

- Integrated 16bit microprocessor
- RS485 bus output signal
- No measuring limit
- 0,01 degree resolution
- Very small linearity fault
- High long time stability
- Hysteresis free signal
- No mechanical part which can be broken
- Hermetically sealed
- Sensor in isolated housing galvanic isolated from measuring electronic
- Mounting ring 360° adjustable for zero setting
- Insensitive to Electro magnetically fields
- Very low zero drift

DESCRIPTION

The **NG360** is a capacitive liquid inclinometer with an integrated 16 bit single chip microprocessor. The basic sensor element consists of four high-precision inclinometer elements which are arranged in a common sensor case. The four single inclinometers are arranged so that they combined act as one high-linear and homogenous 360 degree full turn unit.

The included software eliminates adding up failures, compensate for temperature drift, and by means of factory setting up values create a very accurate 360 degree angle output in RS485 format, with the possibility to have up to 78 units on the same communication line.

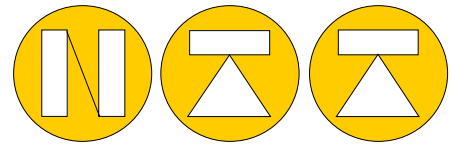
APPLICATION

The **NG360** is the ultimate solution where high accuracy angle measuring is wanted in connecting with PC data logging systems, this open a whole new world for utilising Inclinometers.

These **NG360** series inclinometers have been used with very good results in the mining industry, for pitch and roll measurements, bridges, agriculture machinery, process machines, transport systems and vehicle tilt monitoring plus many other applications and build into OEM systems

Technical Data

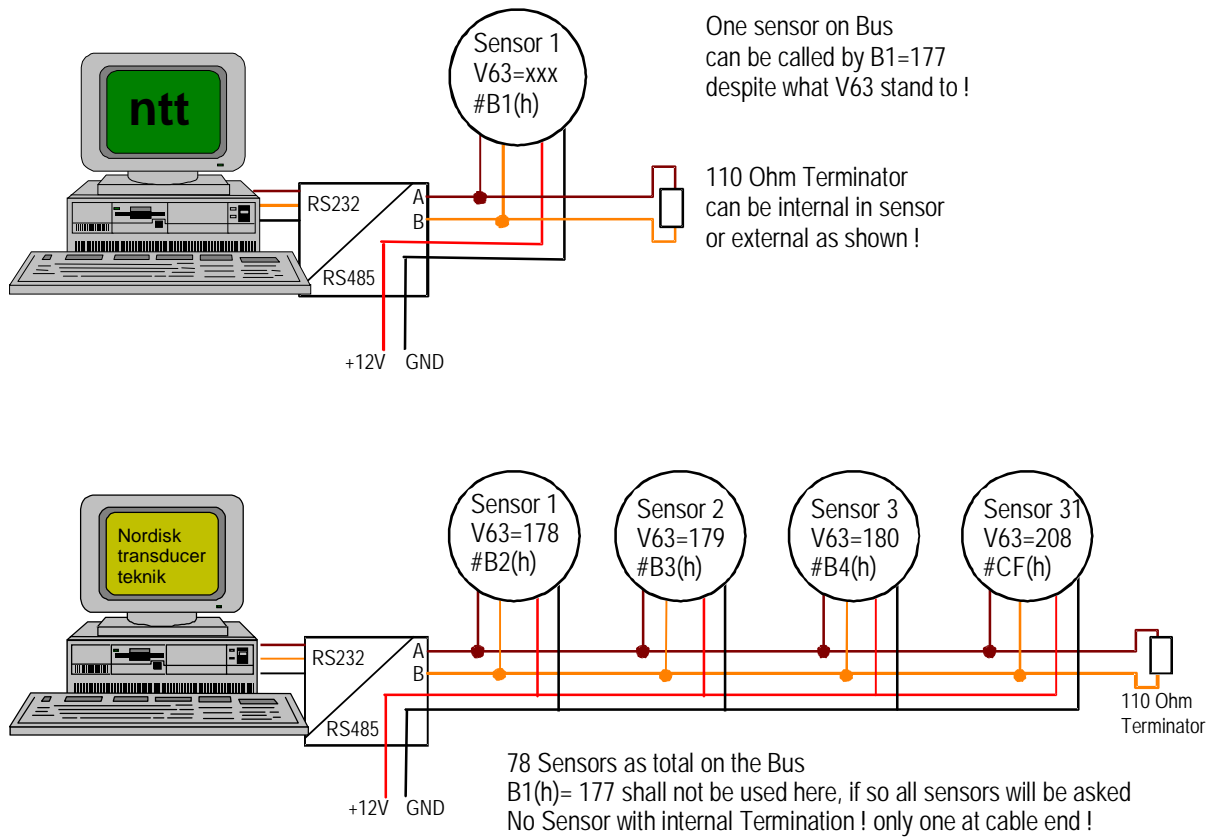
Type	NG360
Measuring range	360 Degree
Resolution	0,01 Degree
Measurements	As enclosed drawing



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Max. Linearity fault	0,15 Degree
max. Cross axis fault	0.1degree at 45° cross tilt
Max. Combined error including temperature fault	+/- 0.25 degree
Response time	Approx. 0,3 Sec.
Nominal supply voltage U_{bN}	12 Volt (min. 9V - max. 15V)
Consumption at $U_b= 9$ Volt	approx.40mA
Protection degree	IP65
Working temperature	-40 to +85°C
Storage Temperature	-45 to +90°C
Weight	approx. 150 Grams
Cable connection	0,5m shielded cable \varnothing 4,6mm

NG360–Sensor with RS485-Bus



Data protocol

Step	PC transmit	Sensor transmit	
1.	Address (e.g. B1 or B2 or B3...)		
2.	ENQ (05h)		
3.	>15ms Pause (switching from receive to transmit in sensor)		
4.		STX (02h) 999.99 Angel in ASCII code) ETB (17h)	
5.		Checksum (2 Byte ASCII code) \$ (24h)	The Checksum is as XOR-Connect the Sensor value made from step 3 (e.g.: 02h XOR 359.99 XOR 17h)
6.	>15ms Pause (switching from transmit to receive in sensor)		
7.	ACK (06h) When the Checksum is OK NAK (15h) When Checksum is wrong		
8.		If ACK, then finish If NAK, return to 3.	

PC-COM- PORT RS232/RS485-Converter

Bit/Sec.	9600
Data bit	8
Parity	Non
Stop bit	1
Protocol	Non

(The handshaking lines RTS and DTR is sat manually)

Software

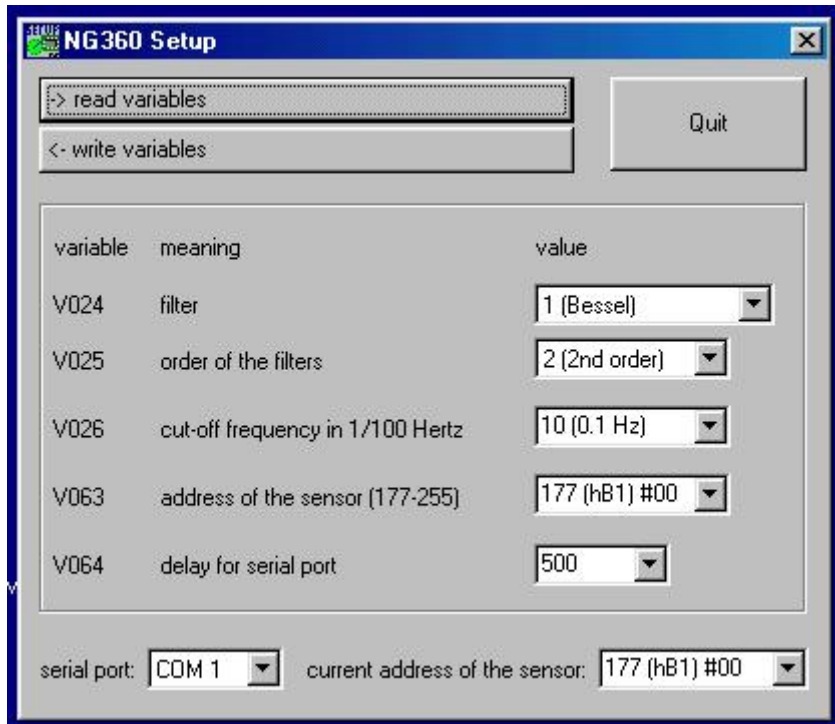
Included in the NG360 delivery is both a set-up program and a communication/angel indication program, both are made for Windows 95/98/XP.

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Setting-up information

If more than one sensor are connected, the sensor internal number must be sat up as explain in the following.

NG360 Setup.exe

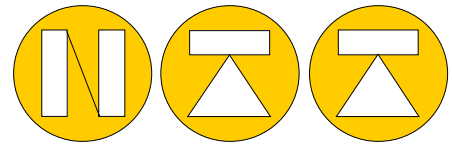


With this program it is possible to get in contact with the sensor first time, and change address if more that one is used.

Com port assignment can also be sat here + as shown the very useful parameters for filters and frequency changes, which can be of great help on different kind of difficult jobs.

Following is only for your information = the meaning of other Variables !

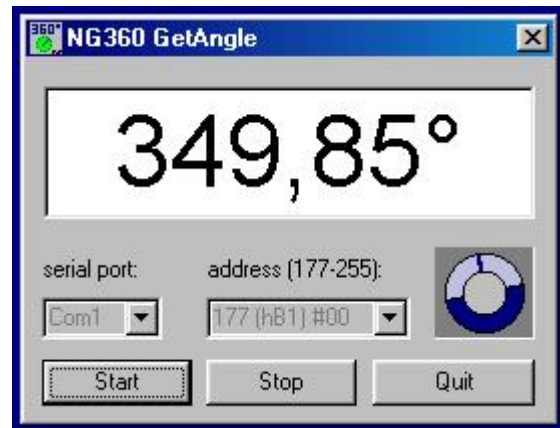
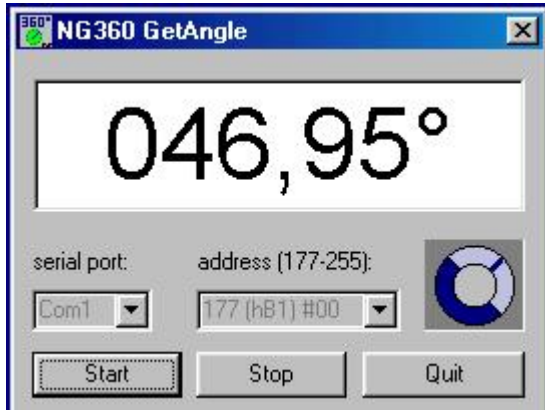
Softwarefilter: V024 =	1 : Bessel filter 2 : Aperiodisch 3 : Butterworth 4 : Tschebyscheff
Filter order: V025 =	1 : 1.Order 2 : 2.Order
Limit frequency: V026 =	10 : 0,1 Hz 50 : 0,5 Hz



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	100 : 1 Hz and so on !
V063 =	Sensor address
V064 =	Delay for serial port used if slow data communication



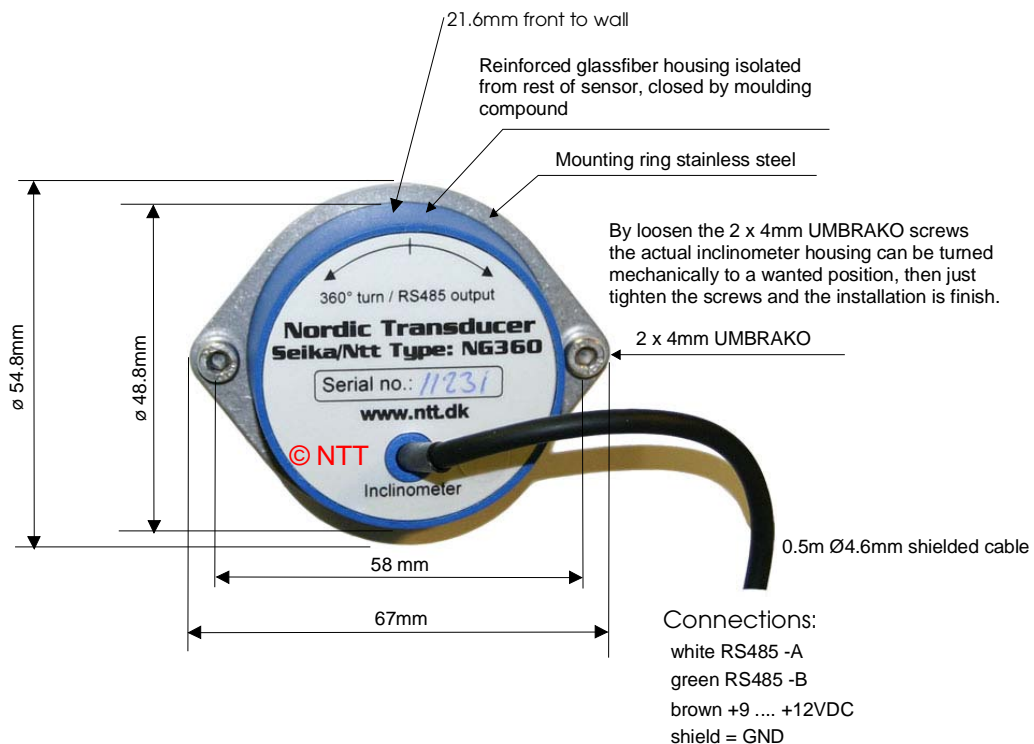
With the program **NG360 GetAngle** it is possible to get in touch with each sensor for direct indication of angel value.

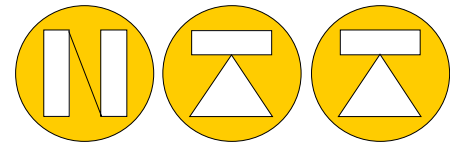
If more than one sensor is connected, **address 177 can not be used**, the correct address must be used for the actual sensor then!

The program NG360Scan.exe can be used to find the correct address on several sensors at a time.

The program NG360Line.exe can be used to show angel from 5 different NG360 sensors at a time.

NG360 Data

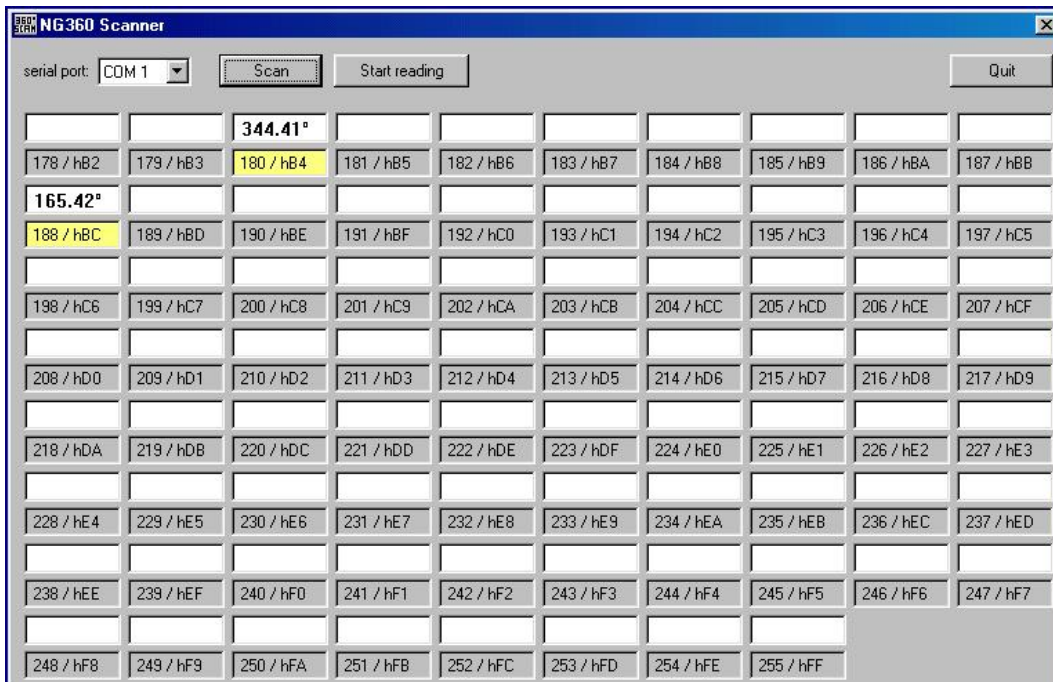




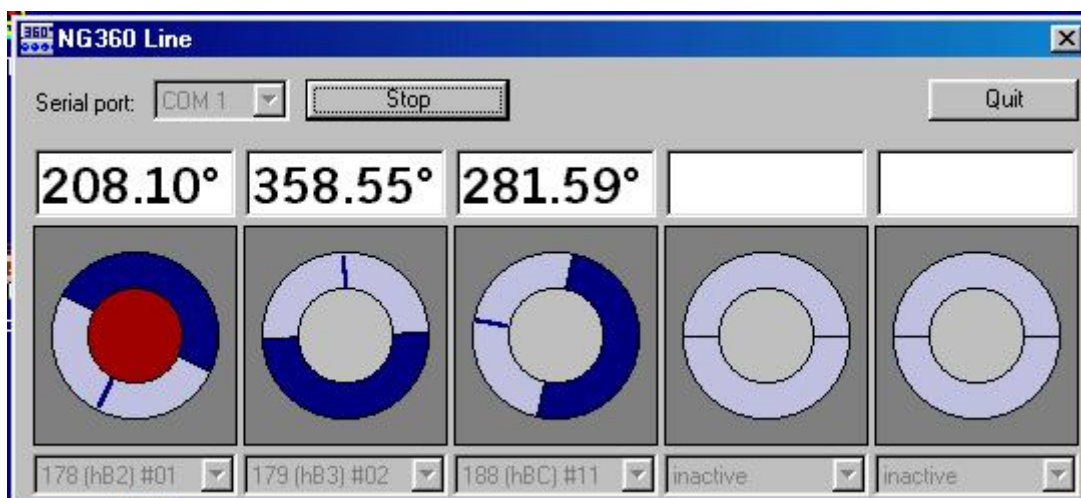
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Caution ! do not short circuit the operating voltage with other wires !

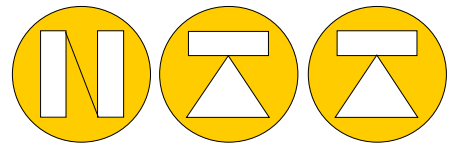
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The program NG360Line.exe can be used to show angle from 5 different NG360 sensors at a time.

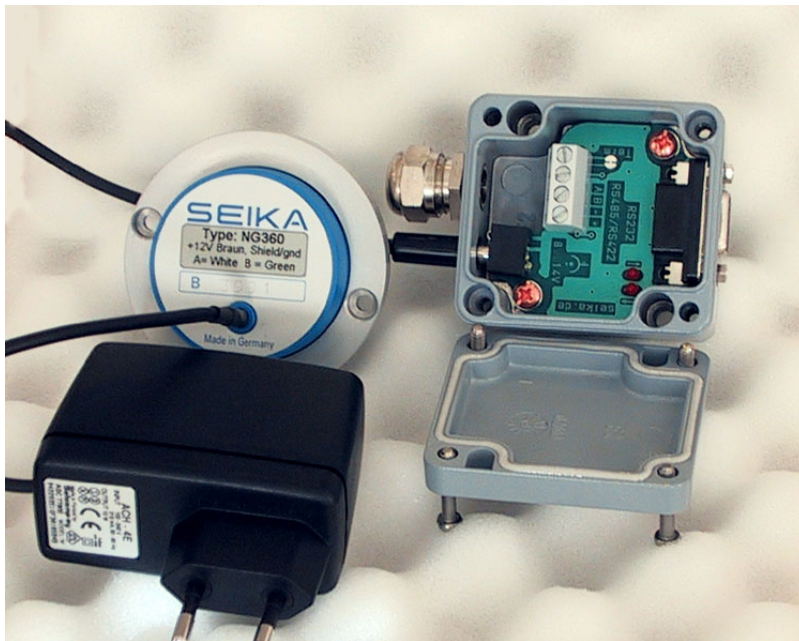


SEIKA / NTT SC485B



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RS232 / RS485 Converter for NG360 digital sensor



The perfect solution for trouble free RS232/485 data communication with NG360 Inclinerometers.

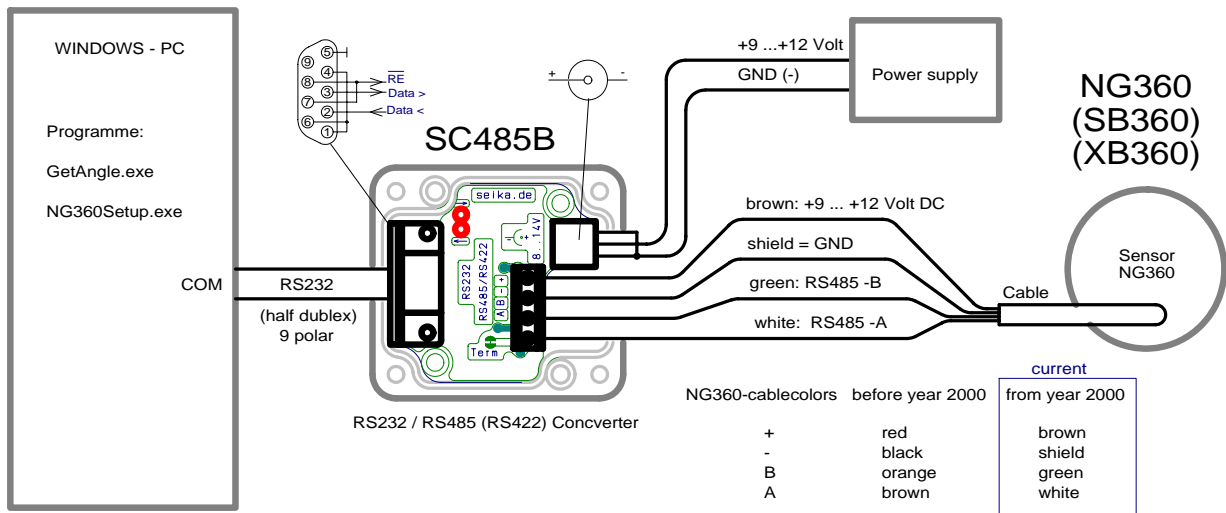
The supply consists of a strong aluminium housing for the converter + a 220V - 12 VDC power supply.

The converter board do also supply the NG360 sensors with +9-12VDC RS232 connection via a standard Dsub 9 pin connector and NG360 connection is via metal PG7 !

2 LED indicate the communication condition.

The past has shown that there is several not to well working RS232/485 converters on the marked to day, to avoid problems with communication we have found that it would be a good thing to develop a unit which we know works day in and day out, so our NG360 customers don't have to think about this as a problem, therefore this **NEW SC485B** is available as an option to whom, which don't have a positive RS485 solution ! and at the same time we have included the power supply as a part of this small handy package !.

The data rate is max. 250kbps working as half duplex RS485 Bus.



DIMENSIONS SB485B: 64mm x 58mm x 36mm high.