

# Tilt Sensors NextGen

## ELECTRICAL DATA

	N6 (Successor N3/N4/N5)	N7 IMU	N3	N4	N5
<b>Technology</b>	MEMS	MEMS	MEMS	MEMS	MEMS
<b>Measurement range</b>	± 90° dual axis / ± 180° single axle (tilt sensor)	± 90° dual axis / ± 180° single axle (tilt sensor) ± 8 g (acceleration sensor, 3-axial) ± 250°/s (gyroskop, 3-axial)	± 60° (single axle)	± 60° (dual axis)	± 90° dual axis / ± 180° single axle (tilt sensor)
<b>Zero justification</b>	± 60°	± 60°	± 5°	± 5°	± 60°
<b>Operating voltage</b>	8-36 V DC	8-36 V DC	10-30V DC	10-30V DC	9-32V DC
<b>Polarity protection</b>	Yes	Yes	Yes	Yes	Yes
<b>Short-circuit resistance</b>	Yes	Yes	No	No	Yes
<b>Interface</b>	CANopen CANopen + relay switching output SAE J1939 SAE J1939 + relay switching output 4-20 mA 4-20 mA + relay switching output 0,5-4,5 V 0,5-4,5 V + relay switching output	CANopen CANopen + relay switching output SAE J1939 SAE J1939 + relay switching output	4-20 mA 4-20 mA + relay switching output 0,5-4,5 V 0,5-4,5 V + relay switching output	4-20 mA 4-20 mA + relay switching output 0,5-4,5 V 0,5-4,5 V + relay switching output	CANopen CANopen + relay switching output SAE J1939 SAE J1939 + relay switching output
<b>Switching output</b>	36 V DC/ 1 A / 30 W 2 x relay NC (relay NO on request)	36 V DC/ 1 A / 30 W 2 x relay NO (relay NC on request)	48 V DC/ 1 A / 30 W 1 x relay NO / 2 x relay NO 1 x relay NC / 2 x relay NC	48 V DC/ 1 A / 30 W 1 x relay NO / 2 x relay NO 1 x relay NC / 2 x relay NC	48 V DC/ 1 A / 30 W 1 x relay NC / 2 x relay NC
<b>Turn-on- /Turn-off delay switching output</b>	selectable (0...2 s in 0,5 s steps)	selectable (0...2 s in 0,5 s steps)	selectable (0...2 s in 0,5 s steps)	selectable (0...2 s in 0,5 s steps)	selectable (0...2 s in 0,5 s steps)
<b>Resolution</b>	≤ 0,014°	≤ 0,014° ≤ 0,244 mg ≤ 0,00875°/s	≤ 25° = ≤ 0,04° > 25° = ≤ 0,14°	≤ 25° = ≤ 0,04° > 25° = ≤ 0,14°	≤ 0,014°
<b>Dynamic accuracy</b>	-	typ. ± 0,5°	-	-	-
<b>Linearity error</b>	max. 1 % of the measuring range	-	max. 1 % of the measuring range	max. 1 % of the measuring range	± 0,4°
<b>Repeatability</b>	typ. ± 0,2°	typ. ± 0,2°	≤ 25° = ± 0,2° > 25° = ± 0,5°	≤ 25° = ± 0,2° > 25° = ± 0,5°	< ± 0,3°
<b>Temperature coefficient</b>	max. ± 0,015°/K	max. ± 0,015°/K max. 0,2 mg/K max. 0,03°/s/K	typ. ± 0.008°/K	typ. ± 0.008°/K	typ. ± 0,02°/K
<b>Sampling rate</b>	100 Hz	100 Hz	100 Hz	100 Hz	200 Hz
<b>Filtering</b>	FIR-Filter	Sensor Fusion (Kalman Filter)	FIR-Filter	FIR-Filter	FIR-Filter
<b>Start Up Time</b>	< 500 ms	< 500 ms	< 500 ms	< 500 ms	< 500 ms

## ENVIRONMENTAL CONDITIONS

	N6 (Successor N3/N4/N5)	N7 IMU	N3	N4	N5
<b>Protection class</b>	IP 67 (ISO 20653) IP 69K (ISO 20653)	IP 67 (ISO 20653) IP 69K (ISO 20653)	IP67 (DIN 60529)	IP67 (DIN 60529)	IP67 (DIN 60529)
<b>Operating temperature</b>	-40... +85 °C	-40... +85 °C (on request)	-40° C... +70 °C	-40° C... +70 °C	-40° C ... +85 °C
<b>Storage temperature</b>	-40... +85 °C	-40... +85 °C	-40° C ... +85 °C	-40° C ... +85 °C	-40° C ... +85 °C
<b>EMC Agricultural machines</b>	EN ISO 14982	EN ISO 14982	2014/30/EU	2014/30/EU	EN ISO 14982
<b>EMC Construction machines</b>	DIN EN ISO 13766-1	DIN EN ISO 13766-1			DIN EN ISO 13766-1
<b>EMC Material handling machines</b>	DIN EN 12895	DIN EN 12895			DIN EN 12895
<b>Vibration resistance</b>	EN 60068-2-64 Random Vibration 8,17 g	EN 60068-2-64 Random Vibration 8,17 g	EN 60068-2-64 Random Vibration 8,17 g	EN 60068-2-64 Random Vibration 8,17 g	EN 60068-2-64 Random Vibration 8,17 g
<b>Shock resistance</b>	EN 60068-2-27 Shock 51 g, 11 ms	EN 60068-2-27 Shock 51 g, 11 ms	DIN 60068-2-27: 50 g, 11 ms	DIN 60068-2-27: 50 g, 11 ms	EN 60068-2-27 Shock 51 g, 11 ms

## MECHANICAL DATA

	N6 (Successor N3/N4/N5)	N7 IMU	N3	N4	N5
<b>Electrical connection</b>	1 x M12 5-pol. (male) 2 x M12 5-pol. (male/ female) Deutsch 8-pol	1 x M12 5-pol. (male) 2 x M12 5-pol. (male/ female) Deutsch 8-pol	Deutsch 8-pol. Cable outlet	Deutsch 8-pol. Cable outlet	1 x M12 5-pol. (male) 2 x M12 5-pol. (male/ female) Deutsch 8-pol

## SERVICEABILITY

	N6 (Successor N3/N4/N5)	N7 IMU	N3	N4	N5
<b>Universal Diagnostics Services (UDS ISO 14229)</b>	Yes	Yes	-	-	-