DOC-ID: CDS-H-TEL-TEN-131001-EN

Tentaclion: Data Acquisition and High-Speed WLAN Telemetry

WLAN telemetry for outdoor applications

wireless data transmission up to 3 km in free field

signal bandwidth up to 20 kHz per channel

transmission protocol with error recognition

up to 8 MB of buffer memory for data storage in bad transmission conditions

use of standard internet protocols

Tentaclion: Versatile Wireless Data Transmission

With **Tentaclion**, CAEMAX introduces an intelligent and fast measurement system, which allows connection of all common sensors, with signal bandwidths of up to 20 kHz per channel. Via Ethernet, the system can be directly connected to any notebook. A WLAN interface supports cordless data transmission— either directly to a notebook with WLAN option within up to 300m of distance, or up to 3km to a transceiver transferring the measurement data via Ethernet interface to a PC.

With wireless data transmission, disruptions due to interferences are inevitable and lead to serious problems for measurement engineers. Bidirectional telemetry systems (transceivers) overcome these problems by transmitting data packets which are then error-checked by the receiver. When disruptions appear, data packets can be requested again until they are received without errors, with up to 8 MB of built-in buffer memory in each transceiver module for temporal storage.

Standard network and internet protocols TCP/IP, HTTP and FTP support remote maintainance by authorized users for downloads of measurement data, parameter changes, control sampling of long-term measurements, file transfers to the support center and firmware updates.

CAEMAX Technologie GmbH
Bunzlauer Platz 1
D-80992 Munich (Germany)
Telefon: +49 - (0)89 - 613049 - 0
Telefax: +49 - (0)89 - 613049 - 57
www.caemax.de
info@caemax.de

DOC-ID: CDS-H-TEL-TEN-131001-EN

Tentaclion: Highly Versatile Signal Amplifier

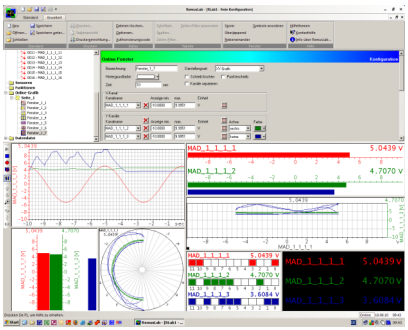
Tentaclion‘s decentral system architecture, where signals are processed directly at the sensor (no long, interference-prone analog wiring) features maximal precision of measurements.

Each channel can be specified seperately, supporting a variety of sensor types, like directly connected strain gauges, microphones, accelerometers (ICP/IEPE), thermocouples (Th-B, E, J, K, L, N, R, S, T, U) or resistance-based sensors (RTD and Pt elements) and more. Signal inputs may be single-ended or differential, with excellent common-mode rejection.

The system offers programmable sampling rates from 12 samples/sec to 48 kSamples/sec with channel bandwidths from 5 Hz to 20 kHz, continuously programmable gain factors from 1 to 1024 (also float values), automatic offset compensation (autozero) as well as programmable sensor power supply.

Convenient Parametrization with RemusLAB

A standard HTTP web server within each module enables parametrization from any software platform and operating system. By calling the module‘s IP address from any web browser, the server is accessed and all parameters can be set. Settings are saved in a local configuration file, where they can be read out externally via FTP server. For even more convenient operation, configuration as well as measurement data storage are integrated in our graphic user interface data acquisition software RemusLAB.



tentaclion

Measurement | Setup | Firmware | Control

TCP/IP | Data Destination | Setup DAQ | Setup RTC

Channels | Sample Rate | Excitation | Gain | Offset | Drift | Calculation | Buffer | Control

#	Name	Label	Type	Range	Filter	Scale Factor	Offset	Unit
1	Channel011	Pressure	Volt	±20	☑	1.0	0.0	bar
2	Channel012	Vibration	ICP	±10	☑	1.0	0.0	V
3	Channel013	Strain	STG	±50	☑	1.0	0.0	mV
4	Channel014	Outside Temp	Th K	±1232.06	☑	1.0	0.0	°C
5	Channel015	Cold Junct Temp	Pt 100	±715.26	☑	1.0	0.0	°C
6	Channel016	Position	RES	±1	☑	1.0	0.0	kOhm
7	Channel017	Battery Voltage	Volt	±20	☑	1.0	0.0	V
8	Channel018	Battery Current	Current	±2	☑	1.0	0.0	A

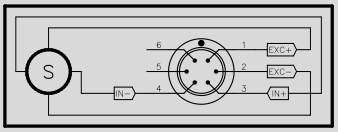
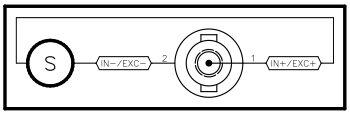
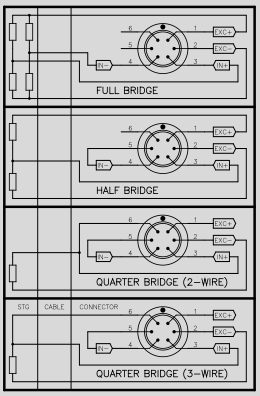
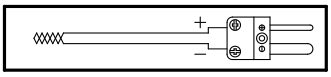
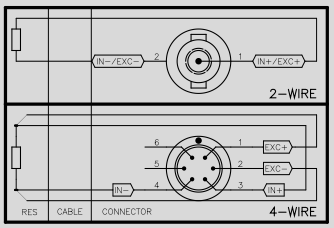
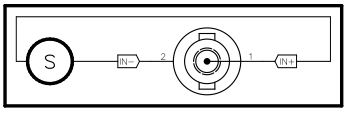
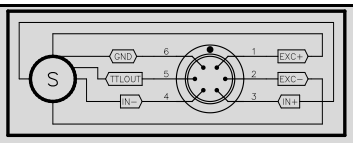
Apply

CAEMAX Technologie GmbH
Bunzlauer Platz 1
D-80992 Munich (Germany)

Telefon: +49 - (0)89 - 613049 - 0
Telefax: +49 - (0)89 - 613049 - 57

www.caemax.de
info@caemax.de

Tentaclion - Top-Verstärker zum Anschluß der Sensoren

Order code	Sensors[1]	Properties	Standard -socket[1]	Pin assignment[4]
TNT-ST-SC -EXC-N	Wide range excitation	+15V or ±15V fix, uncalibrated, max. 200mW	Lemo	
TNT-ST-SC -EXC-V	Voltage excitation	0V bis 10V free programmable	Lemo	
TNT-ST-SC -EXC-C	Current excitation	0.1 to 4mA free programmable	Lemo	
TNT-ST-SC -ICP	Microphone, ICP accelerometer	0.1 to 4mA free programmable excitation	BNC	
TNT-ST-SC -STG	Strain gauges, Resistance bridges	0 to 10V free programmable excitation full-, half- and quarter-bridges in 2- or 3-wire system ≥ 350 Ohm, integrated half- and quarter bridge completion - 350 Ohm[1]	Lemo	
TNT-ST-SC -TH	Thermocouple	Types K, T, J, E, S[1, 2], clampings points-compensation, linearisation	Thermo	
TNT-ST-SC -RTD	Resistant based Sensors, Pt-Elements	0.1 to 4mA free programmable excitation, at Pt100 to Pt1000[2] offset compensation and linearisation	BNC, Lemo[3]	
TNT-ST-SC -CUR	Currents	Input range ±25mA, Impedance 40 Ohm	BNC	
TNT-ST-SC -DOUT	eg. reset-signal for capacitive Sensors	Digital TTL-control output	BNC	

(1) Others on request
(2) Required when ordering
(3) BNC in 2-wire technology
Lemo in 4-wire technology

(4) Pin orientation always from outside perspective on male or female, EXC + positive excitation, EXC – negative excitation, positive signal input IN+, IN- negative signal input (with no differential input ground)

CAEMAX Technologie GmbH
Bunzlauer Platz 1
D-80992 Munich (Germany)
Telefon: +49 - (0)89 - 613049 - 0
Telefax: +49 - (0)89 - 613049 - 57
www.caemax.de
info@caemax.de

Tentaclion - Technical Data

	TNT-ST-SENS1 / 2 / 3 / 4				TNT-ST-SENS6 / 8	
Number of channels	1 - 4				5 - 8	
Dimension[1]	120 x 70 x 30mm				120 x 70 x 58mm[2]	
Weight[3]	ca. 350g				ca. 650g	
Power consumption[4]	ca. 4W				ca. 5W	
Initialization time	20s (fast booting) / 30s (safe booting = default)					
Module Properties					Channel Properties	
TNT-bus connections	2 (independent)				Sample rate	Bandwidth
Standard protocols[5]	IP, ICMP,TCP, UDP, HTTP, FTP				48kSps	20kHz
Data ring buffer[6]	2MByte RAM				24kSps	10KHz
Power supply	9-36V				12kSps	5kHz
Resolution	16Bit				4800Sps	2kHz
Dynamic range	96dB				2400Sps	1kHz
Anti-Aliasing-Filter	FIR, linear phase, 130 taps				1200Sps	500Hz
Passband ripple	< 0.1dB				480Sps	200Hz
Stopband attenuation	> 50dB				240Sps	100Hz
Frequency ratio f_S/f_D[7]	1.2				120Sps	50Hz
Phase tolerance[8]	< 1°				48Sps	20Hz
Number of modules [9]	2	4	8	16	24Sps	10Hz
Synchronization period[10]	3s	5s	10s	15s	12Sps	5Hz
Synchronization tolerance [10]	±3µs	±5µs	±40µs	±75µs	Sample rate	SNR[16]
Phase stability[11]	< ±0.05ppm / ±2ppm [12]				48kSps	68dB
System accuracy[13]	< 0.25%				24kSps	70dB
Environmental Conditions					12kSps	72dB
Operating temperature	-40 - +85°C				4800Sps	74dB
Humidity	5 – 95% (nicht condensing)				2400Sps	76dB
Protection class	IP68 (permanently under water)				1200Sps	78dB
Shock[14]	< 1000G				480Sps	80dB
Vibration[15]	< 100G				240Sps	82dB
Options					120Sps	84dB
TNT-ST-OPT-VM4	4MByte RAM data ring buffer				48Sps	86dB
TNT-ST-OPT-VM8	8MByte RAM data ring buffer				24Sps	88dB
TNT-ST-OPT-NVM1	1MByte FLASH memory				12Sps	90dB
TNT-ST-OPT-SHDN	Shut-down-mode				Offset stability[13]	
TNT-ST-OPT-SPG-TOP	Spring contact connection inside				±20V	±0.15%
	module cover for TNT bus				±1V	±0.15%
	instead of Lemo socket				±50mV	±0.18%
TNT-ST-OPT-SPG-BOT	Spring contact connection inside				Crosstalk	68dB
	module cover for TNT bus				Sensor excitation	
	instead of Lemo socket				Accuracy	0.1%
Status					max.capacity/ch	120mW
µCLinux V2.1 / DAQ V3.1	in production				Shortcircuit protect	10s

(1) Without connectors
(2) With multiple connector also available 70x120x30 mm
(3) Depending on the used sensor connection
(4) Without sensors
(5) Others on request, for example POP3, SMTP, HTTPS, SFTP
(6) See option
(7) Ratio of cut-off frequency of stopband and passband
(8) Between the channels of a module
(9) Linked linear over TNT bus master in a central position
(10) Average/typical
(11) Between the different channel modules
(12) With/without drift compensation
(13) Over the entire temperature and measurement range
(14) Half sine 2ms, with optional higher electronic encapsulation
(15) Sine (22-500Hz), with optional higher electronic encapsulation

CAEMAX Technologie GmbH
Bunzlauer Platz 1
D-80992 Munich (Germany)
Phone: +49 - (0)89 - 613049 - 0
Fax: +49 - (0)89 - 613049 - 57
www.caemax.de
info@caemax.de