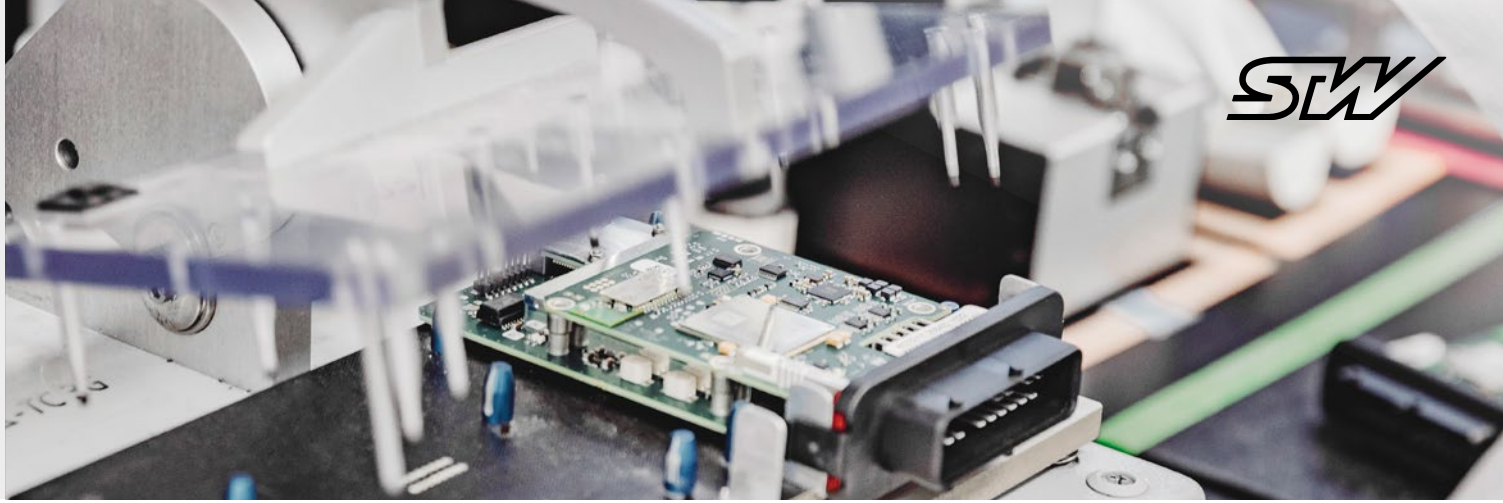


TCG-4lite

TCG data modules

KEY FEATURES

- 4G/LTE connectivity
- Embedded Linux for fast and easy development of applications
- Compatible with major cloud platforms
- Compliance with standards for the automotive, agricultural and construction machinery industries.

TECHNICAL DATA

- i.MX 6UL @696 MHz 8 GB Flash / 512 MB RAM
- 4G/3G/2G communication
- GPS / GLONASS / BEIDOU / GALILEO
- 2 CAN interfaces
- Single Pair Ethernet 100BASE-T1
- USB 2.0

ACCESSORIES

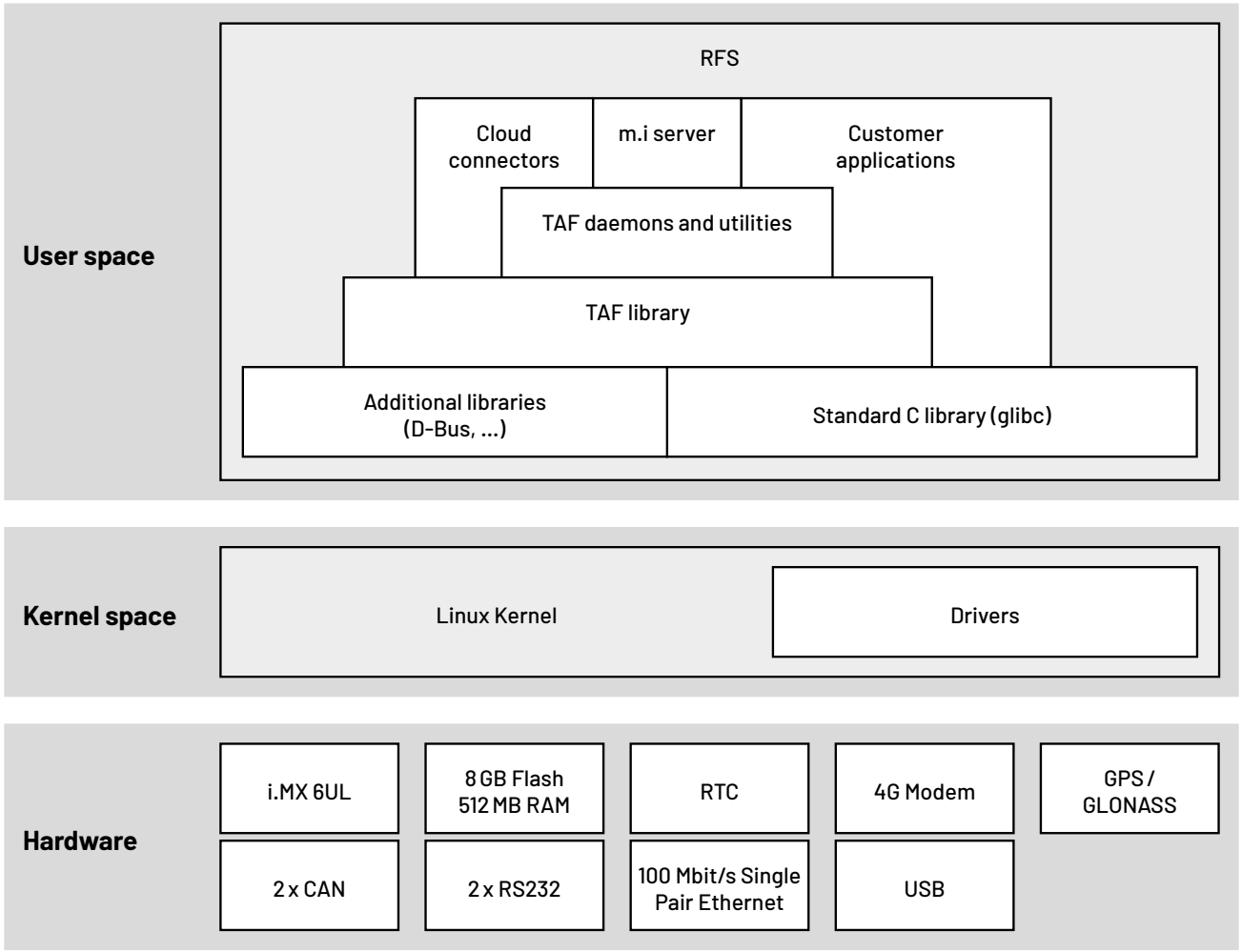
- Mating plug
- Development box with power supply
- Breakout cable for development purposes
- Antennas for wireless communication interfaces

Sensor-Technik Wiedemann GmbH

Am Bärenwald 6
87600 Kaufbeuren
Germany

+49 8341 9505-0
info.stw@wiedemann-group.com
www.stw-mm.com

SYSTEM ARCHITECTURE



TECHNICAL DATA

Software Data

Type	Features
Operation system	Embedded Linux
Buildroot version	2022.02.8
Linux kernel version	5.4
Programming language	C/C++, Shell script, other programming languages available on request
Teleservice application framework	A set of daemons and utilities providing connectivity and telematic functionalities

Development Package

Type	Features
Documentation	Contains all necessary user documentation and help files for product usage.
Libaries	Contains STW's library frameworks, which provide beneficial functionality for faster development.
Toolchain	Contains the GCC Linaro Toolchain that allows users to build own application within Linux and Windows.
OPKG packages	Contains all of STW provided OPK packages. Possibility of individual updates.
Board support package	Contains all components, which are necessary to boot up the system. Included components are the bootloader Uboot, the Linux kernel, the device tree for hardware abstraction and the root file system.
BSP updater	Application for updating the board support package (BSP) of the device under Linux and Windows.

System

Type	Features
Power supply	9 ... 32 V DC
Current consumption	Standby < 1 mA (@12 V) Normal operations (typ.) 230 mA (@12 V)
Dimensions (L x W x H)	183 x 117.4 x 36 mm
Connector	Tyco, 3 rows, female 29pin

Processor and Memory

Type	Features
Processor	32 bit controller, NXP i.MX 6UltraLite, 696 MHz
RAM	512 MB DDR3L-SDRAM
EEPROM	64 kB
eMMC memory	8 GB (4 GB reserved for system)
RTC	Real time clock with internal gold cap for maintaining time for approx. 7 days and system wakeup function

Miscellaneous

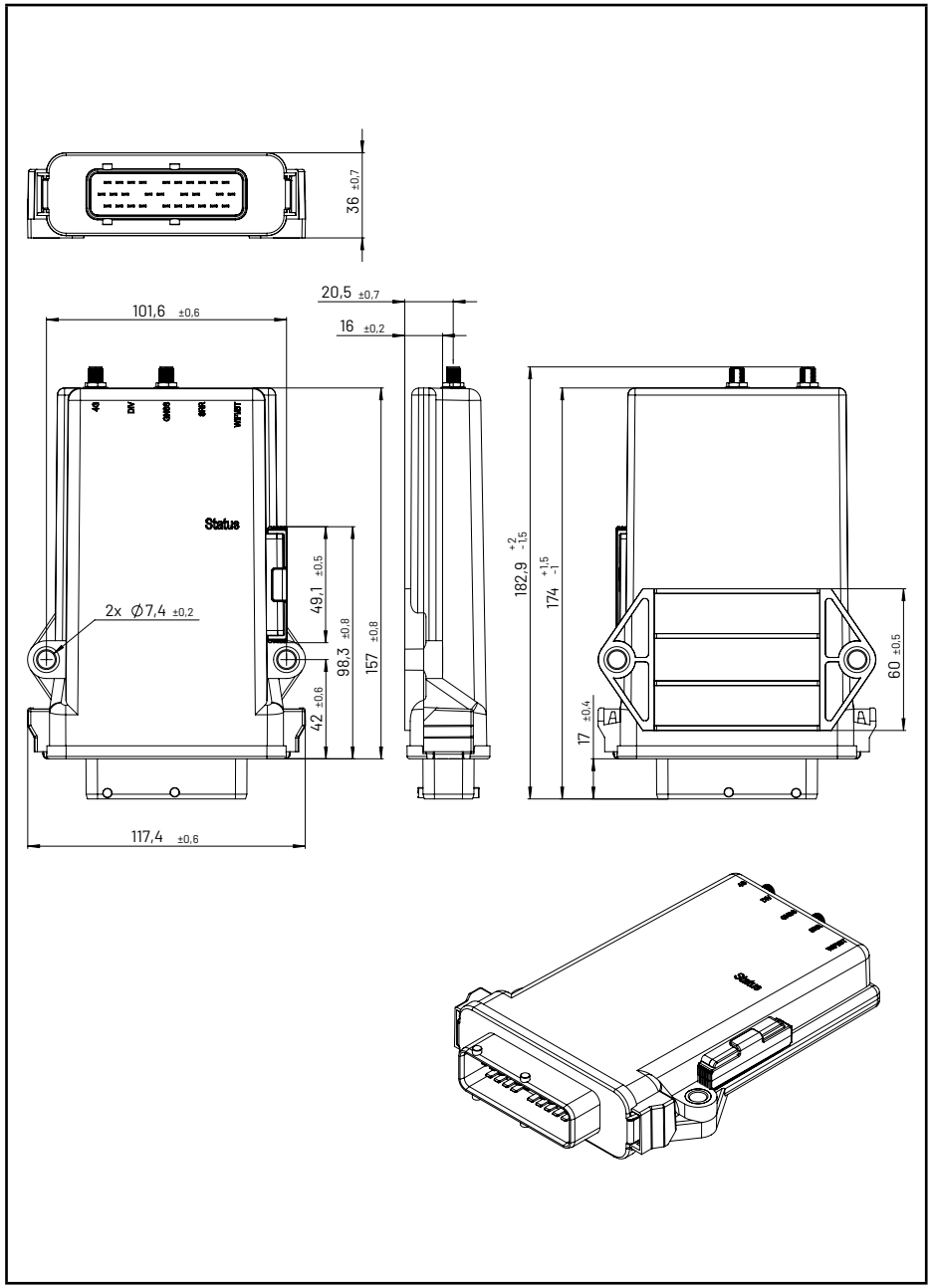
Type	Features
Watchdog	Configurable watchdog
Temperature sensor	Measuring range -40 °C to +85 °C / -40 °F ... +122 °F

TECHNICAL DATA

Communication Interfaces

Type	Quantity	Configuration
4G modem	1	Global: • 4G: LTE Cat. 1 (FDD: B1/2/3/4/5/7/8/12/13/18/19/20/26/28) (TDD: B38/B39/B40/B41) • 3G: B1/2/4/5/6/8/19 • 2G: B2/3/5/8 SIM card options: • 2FF Mini SIM card, can be accessed through a clip at the side of the housing. • Alternative: MFF2 eSIM card, can be placed on the PCB (optional)
GNSS	1	GPS, GLONASS, BeiDou, Galileo, QZSS, 1 Hz update rate
CAN	2	CAN 2.0 B, high / low-speed, max. 1 Mbps, listen only mode possible
RS232	2	Serial interface with programmable baud rate up to 230400 baud
Ethernet	1	100BASE-T1 (optional)
USB	1	USB 2.0 OTG

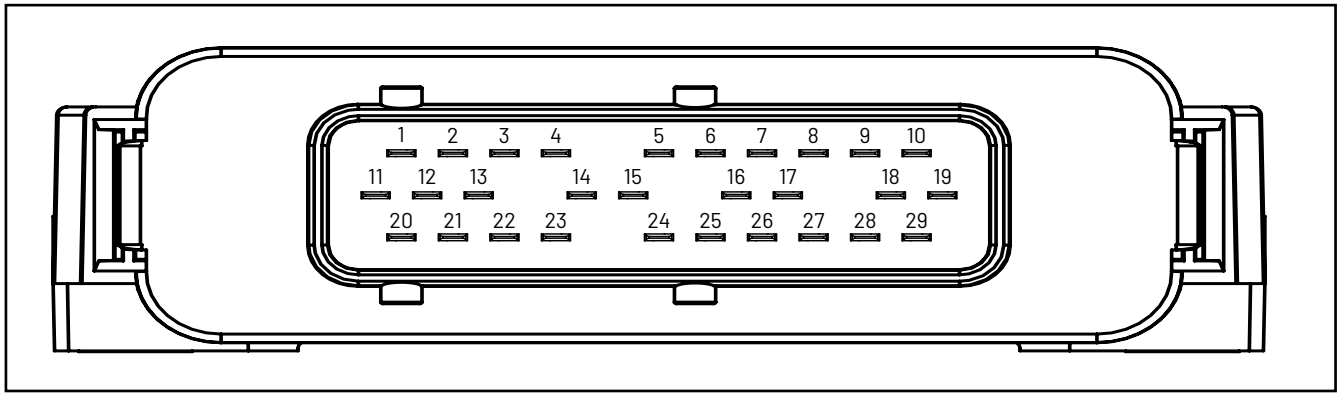
TECHNICAL DRAWING



PIN ASSIGNMENT TCG-4lite

Pin assignment sorted by pin numbers

Pin	Description
1	Single Pair Ethernet minus
2	Single Pair Ethernet plus
3	RS232_2 Rx
4	RS232_2 Tx
5	–
6	USB on-the-go ID pin
7	–
8	+UB Power supply (6 ... 32 V DC)
9	GND
10	Ignition pin / switched power line
11	–
12	–
13	–
14	–
15	–
16	USB 5V
17	–
18	RS232 RxD
19	RS232 TxD
20	CAN1 Low
21	CAN1 High
22	CAN2 Low
23	CAN2 High
24	USB D-
25	USB D+
26	–
27	–
28	–
29	–



QUALIFICATION

Regulatory body / Standard	Description	Remarks
CE conformity	Conformity is found in the User Manual	
KBA (Kraftfahrt-Bundesamt)	Compliant with the requirements of UN ECE Regulation No. 10	This approved device can be used on any vehicle type with the following restrictions: All vehicle types with a 12 V respectively 24 V electrical wiring and battery(-) at the body.
FCC	FCC 47 C.F.R. Part 15, Subpart B / C Module integration OET 65 (Human exposure)	This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules
ISED	Canada radio approval	
PTCRB		
ACMA	Australia / New Zealand radio approval	
JATE / MIC	Japan radio approval	
RRA / KCC	South Korea radio approval	
ISO 16750	Road Vehicles – Environmental conditions and electrical testing for electrical and electronic equipment	IP6Kx/IPx7
DIN EN 13309	Construction machinery - Electromagnetic compatibility of machines with internal power supply	
ISO 13766	Earth-moving machinery - Electromagnetic compatibility	
DIN EN ISO 14982	Agricultural and forestry machines - Electromagnetic compatibility	Compliance with this standard is only achieved in combination with an external load-dump module. The max. clamping voltage must not exceed 55 V!

QUALIFICATION

Environmental qualification

Standard	Test description	Parameter
ISO 20653	IP protection class	IP6Kx, IPx7
DIN EN 60068-2-6	Vibration (sinusoidal)	10 Hz to 2 kHz, 1 oct./min., 5 g, 10 cycles, bidirectional
DIN EN 60068-2-27	Shock	50 g, 11 ms, half sinus, 3 shocks/axis
DIN EN 60068-2-27	Bump	30 g, 6 ms, half sinus, 1000 shocks/axis
ISO 16750-4	Tests at constant temperature - high temperature - storage	48 hours at 85 °C
ISO 16750-4	Tests at constant temperature - low temperature - storage	24 hours at -40 °C

Countries with certification for 4G usage

Australia	Estonia	Italy	New Zealand	Spain
Austria	Finland	Japan	Norway	Sweden
Belgium	France	Latvia	Poland	Switzerland
Bulgaria	Germany	Liechtenstein	Portugal	United Kingdom
Croatia	Greece	Lithuania	Romania	USA (depending on mobile service provider)
Cyprus	Hungary	Luxembourg	Slovakia	
Czech Republic	Iceland	Malta	Slovenia	
Denmark	Ireland	Netherlands	South Korea	