



Solar Monitor SM3-IoT Module Specification



The **LTE Cat M1 & Cat NB1 & EGPRS** module with **ultra-low power consumption** is used to **transfer data for Internet of Things**, where a connected cpu is responsible for data stream or module's embedded Internet protocols are used to handle application data, which are sent to the module with AT commands.

Module is a typical LPWA device (Low Power Wide Area) with its LTE-M and NB-IoT features. NB-IoT with its DSSS (Direct Sequence Spread Spectrum), only 200 kHz bandwidth used and extended idle mode (e-I-DRX) is ideal for battery solutions, where data are sent time by time and in low volumes.

RF Parameters	
Frequency Band	Cat M1 & NB1: LTE-FDD: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B254/B26*/B28 LTE-TDD: B39(for Cat M1only) GSM: GSM850/EGSM900/DCS1800/PCS1900 GNSS: GPS, GLONASS, BeiDou/Compass, Galileo, QZSS ¹
Transmitting Power	Class 3 (23 dBm $\pm$ 2 dB) for LTE-FDD bands Class 3 (23 dBm $\pm$ 2 dB) for LTE-TDD bands Class 4 (33 dBm $\pm$ 2 dB) for GSM850 Class 4 (33 dBm $\pm$ 2 dB) for EGSM900 Class 1 (30 dBm $\pm$ 2 dB) for DCS1800 Class 1 (30 dBm $\pm$ 2 dB) for PCS1900 Class E2 (27 dBm $\pm$ 3 dB) for GSM850 8-PSK Class E2 (27 dBm $\pm$ 3 dB) for EGSM900 8-PSK Class E2 (26 dBm $\pm$ 3 dB) for DCS1800 8-PSK Class E2 (26 dBm $\pm$ 3 dB) for PCS1900 8-PSK
Certificates	AT&T, BELL*, CCC, CE, DOCOMO*, Deutsche Telekom, FCC, GCF, IC, IFETEL, IFETEL, IMDA, NCC, JATE, KC, KDDI, LGU+*, PTCRB, RCM, SKT, Softbank, T-Mobile, TELEC, Telefonica, Telstra, Telus, Verizon, Vodafone ^{*2}
Data and protocols	
Transmission Data	LTE Cat M1: Max. 375 kbps (DL & UL) LTE Cat NB1: Max. 32 kbps (DL) / 70 kbps (UL) EDGE: Max. 296 kbps (DL) / 236.8 kbps (UL) GPRS: Max. 107 kbps (DL) / 85.6 kbps (UL)

¹ It is necessary to add an aerial interface to support the GNSS features..

² Under development .

LTE Features	Support 1.4 MHz RF bandwidth for LTE Cat M1 Support 200 kHz RF bandwidth for LTE Cat NB1 Support SISO in DL direction
GSM / GPRS / EDGE Features	GPRS: Support GPRS multi-slot class 33 (33 by default) Coding scheme: CS-1, CS-2, CS-3 and CS-4
	EDGE: Support EDGE multi-slot class 33 (33 by default) Support GMSK and 8-PSK for different MCS (Modulation and Coding Scheme) DL coding schemes: CS 1-4 and MCS 1-9 UL coding schemes: CS 1-4 and MCS 1-9
Internet	TCP, UDP, PPP, SSL, TLS FTP(S), HTTP(S), NITZ, PING, MQTT
PPP	PAP (Password Authentication Protocol) CHAP (ChallengeHandshake Authentication Protocol)
Aerial and SIM	
RF Connector	SMA (male)
SIM Card	SIM and USIM: 1.8 V, 3 V
Communication Interface	
RS232	RJ12 connector and HBUS (in a DIN rail, bottom pluggable, no external wires needed) ³
Max. Distance	12 m
Baud Rate	921.600 bps 460.800 bps 230.400 bps 115.200 bps (default) 57.600 bps 38.400 bps 19.200 bps 9.600 bps
Flow Control	RTS / CTS
Signals	6-wire on UART interface, no CD, no DSR
Firmware Upgrade	supported via UART
Electrical parameters	
Power Supply	9-35 V DC, typ. 1.2 W @ 12V ^{4, 5}

3 Interface connectors are mutually exclusive. The HBUS interface is intended to be used with the SM2-MU unit module. With the RJ12 connector the SM2-GSM module can be used as an individual GSM/GPRS modem with automatic power management by the DTR signal.

4 There is no need for additional power supply if the module is connected with the HBUS to the SM2-MU. In this case appropriate power supply for the SM2-MU should be selected to provide sufficient power for all modules on the HBUS.

5 During transmission, there can be consumption peak bursts up to 10.4 W.

Sleep Mode	LTE CatM1: 1.5 mA @ DRX=1.28 s 1.2 mA @ e-I-DRX=40.96 s LTE CatNB1: 1.96 mA @ DRX=1.28 s 1.1 mA @ e-I-DRX=40.96 s 2G: 2.0 mA
Power Save Mode	10 uA @ PSM
Mechanical Parameters	
Dimensions	35,6 x 89,7 x 62,2 mm
Mounting	DIN rail
Screw Terminals	0.5 mm ² - 1.5 mm ² cable cores
Protection Rating	IP20
Extended Temperature Range	-40°C ~ +85°C
LED diodes	Status, GSM network

Mechanical Dimensions

