

NB-IoT Modem User Manual



Ver 1.2

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Energycare Holding, Jeddah, Kingdom of Saudi Arabia (KSA)

6481 Nahdat Al Jil – Ar Rwadah District.- Prince Mohammed Bin Abdulaziz St. (Tahlia) -Unit.2, Jeddah 23432-3736 , Saudi Arabia

Version	Date	Revision history	Controller Firmware version
V1.0	2020.3.25	First Issue	1.0
V1.1	2021.1.8	Add module size and structure.	1.1
V1.2	2021.1.11	Multiple Edits	1.1.

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1. Signs and Abbreviations

Table 1-1 Signs and Abbreviations

Abbreviations	Descriptions
NB	Narrow Band
HES	Head Ends System
APN	Access Point Name
GPRS	General Packet Radio Service
4G	4rd-Generation
GSM	Global System for Mobile communications
LED	Light Emitting Diode
SIM	Subscriber Identity Module
SMA	Sub Miniature version A connector
TCP/IP	Transmission Control Protocol/Internet Protocol

2. Safety Instructions



Please ensure you read and understand the installation instructions entirely before attempting to install and configure NB Modem.



Always disconnect the mains supply while installing or servicing the communication interfaces, antenna or changing SIM card.



Only the authorized service persons with adequate qualifications can perform installation, un-installation and parameterization of the NB modem.



NB modem should be mounted in restricted access locations. Only authorized personnel should be able to access this location.



Some parts may remain energized even if the power is disconnected! Do not try to disassemble internal components. There are no serviceable parts inside.



SIM card slot is protected against unauthorized access.

3. Application and Functionality

3.1. General Information

The modem is used for automated remote data transmission between smart meters and HES. Modem does not store, manipulate or alter meter information. The controller has super capacitor with 2.5F for power failure notification to the remote data center (HES). NB network with GPRS/NB technology and transparent data, TCP/IP protocols is used for data transmission to the management system.

3.2. Supported Communication Protocols

The modem supports two-direction data exchange with communication protocols IDIS ST (CES) data model.

3.3. Configuration

The parameters for NB modem are all stored in meter and can be performed locally (using local software) and remotely by HES via 2G/NB. NB modem also supports all the parameters set individually or in group. And modem supports both TCP/IP server and client connection modes.

3.4. Mounting and power supply

NB modem is mounted (can be replaced) under the terminal covers of electricity meters. The meter terminal cover has a screw for sealing modem from an unauthorized access. When mounted properly, all of the modem indications are visible. The modem is powered by the external power source from the meters.

3.5. Automatically Register

The modem can automatically register in the cellular network after power or mobile network coverage restoration or restart, and NB network is priority.

3.6. Firmware update

The NB modem firmware can be updated locally (via Serial Port between modem and meter) and remotely (via HES).

3.7. Mobile network signal strength monitor

When NB modem powers on, the modem automatically tries to connect to the best network, during which network LED is fast blinking. After register, network LED blink slowly. And when communication, T/R LED will be on and off, details of which is described in Table5-3.

3.8. Alarm system

When any event or alarm is received from the meter to the NB modem, the modem will send all the data to target address (IP and Port).

3.9. Last Gasp

NB Modem can provide the last gasp to HES in case of power lose.

3.10. Restart without interrupting power supply

NB Modem can restart without interrupting the power supply from the meter remotely (via HES) and locally (using Local Software), and the restart frequency and time can be set locally and remotely. And also it is possible to set the modem automatic restart frequency and time individually or in group.

4. Technical Characteristics

4.1. NB modem General feature

- Operating frequencies in mobile networks
 - 2G(GSM/GPRS/EDGE) EGSM900MHz/DCS1800MHz
- Operating frequencies in mobile networks
 - NBB3/B5/B8/B20/B28

Table 5-1 Specification for data transfer

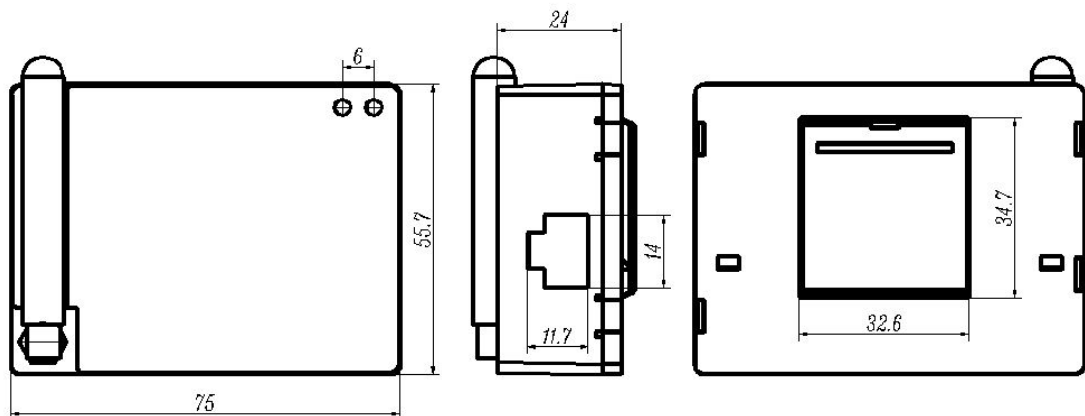
GPRS	Max. 85.6Kbps (DL), Max. 85.6Kbps(UL)
EDGE	Max. 236.8Kbps (DL), Max. 236.8Kbps(UL)
NB	136Kbps(DL),150Kbps(UL)

4.2. NB modem technical characteristics

Table 5-2 NBmodem technical characteristics

Dimensions	75*55.7*24 mm
Power supply input voltage range	12V
Power consumption:	
a. maximum in transmission mode:	7W
b. average in duty mode:	1W
Number of simultaneous communication sessions	6
Work temperature range °C	-40 °C ~ +85 °C
Storage temperature range °C	-40 °C ~ +85 °C
Relative humidity, % without condensate	20...95
Protection against penetration of dust and water (EN 50470-1)	IP54
Antenna	SMA Female 50 Ohm, supports external antenna with magnetic base and cable length >=1.5m
Plastic Materials, safety of flammability	ABS, UL94-V0

4.3. NB modem structure diagram



4.4. NB modem indication description for meter

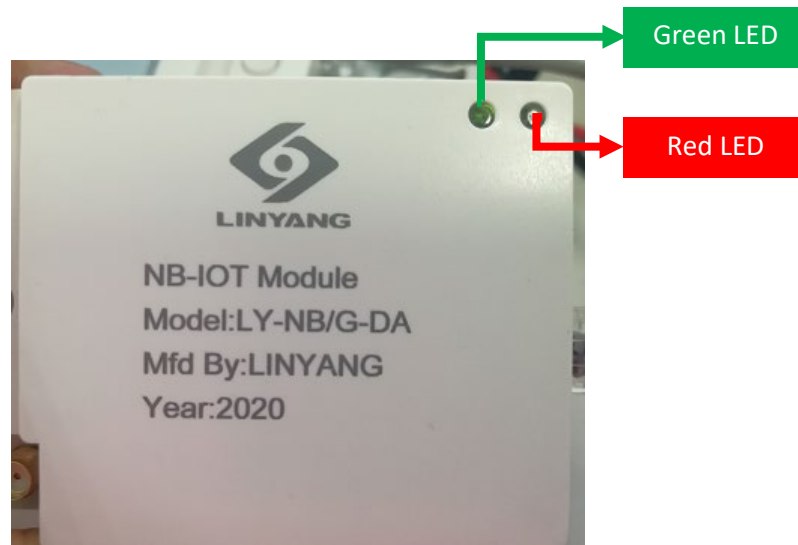


Table 5-3 NBmodem indication description for meter

RED LED	Continuous ON	RS-485 line with meter is broken
	Blinking	Transmitting Heart beat to meter or Transmitting Data to HES
	Continuous OFF	No Power or Modem broken
GREEN LED	Blink at 20 Hz	No SIM card or Not registered to Network
	Blink at 1 Hz	Registered to Network Success
	ON	Socket created with HES
	OFF	No power or modem broken