



LTE cat.1/cat.3/cat.4

UMTS/HSPA+

GSM/EDGE

RS232/485

USB

I/O Ports

GPS

AES128 encryption

SMS

USSD

MAIL

Remote Access

CLI

SNMP

TR-069

Group Management

**Working temperatures
range: from -40°C to
+70°C**

DGT TRAM is a family of industrial communication modems providing remote access to remote customer system units with use of data transmission services, offered by cellular networks or other radio technologies.

TRAM family products are used in those applications, where reliable access to data transmission networks is important. Electricity meters are the important application fields of TRAM modems, as they are integral part of the Intelligent Grid Networks.

The TRAM devices are available in many variants, and their equipment and functionality, thanks to the flexible hardware and software construction, are tailored to the customer's requirements. For example, for various types of energy meters we have developed dedicated versions of modems: integrated with the meter's main board and replaceable (mounted in a counter housing, in an separated case).

TRAM modems, implementing telemechanics functionality installed in other industrial devices are designed with strict accordance to the customer's specification. They can have form of a separate device, e.g. industrial external modem, or they can be integrated into other equipment as the internal subsystem.

TRAM products implement telemechanics functionality:

- telemetry - remote reading the data (e.g. from electricity meters),
- remote control - remote supervision of control systems, etc.
- remote access to other devices.

WWAN access

DGT TRAM devices enable building modern distributed industrial systems (e.g. Smart Grid) where is a need to add the functionality of wireless communication with central systems over the latest generation cellular systems as LTE and compatible with older UMTS and GSM systems and also in the CSD channel commutation mode in 2G systems.

Local communication

Local communication between TRAM modems and distributed system devices takes place through serial interfaces, e.g.: RS485, RS232, RS232 with TTL voltage level and CLO.

Communication can take place in transparent or buffer mode using standard protocols (e.g. MODBUS) or industry protocols.

The binary I/O ports are used to transfer information about the client device status changes (inputs), and to control remote devices (outputs). The TRAM device can also equipped with analog input with A/D converter or analog output.

Powiadomienia

TRAM modems enable sending information about events or other data (eg read-out) with use of SMS, USSD, SNMP-TRAP messages or e-mails to the predefined address.

An additional option of sending notifications when a power loss occurs is the "last gasp" optional feature.

Security

The devices enable to create the encrypted communication channel based on AES128. In addition, they have built-in access control mechanisms based on authentication and authorization.

Reliability

Increased equipment operation reliability is achieved by multi-level monitoring mechanisms, both hardware and software (the 'watchdog').

Service software

Modem configuration is carried out over local interface and remote access using the CLI interface and the Telnet/ssh protocol. The documented set of CLI commands enables advanced diagnostics, monitoring and configuration of the modem.

Together with the TRAM communication module, the KZUT application with a graphical user interface can be delivered. It has multi-level authorization and offers CLI functionality using the local interface or remote access via TCP/IP.

Group management

TRAM module manufacturer provides the remote group management software package - DGT EMS TRAM. It performs simultaneous updating the firmware, configuration changes and diagnostics in large number of TRAM devices.

For integration with third-party EMS systems, the devices enable access with use of TR-069 or SNMP v2c and v3 protocols for monitoring of parameters, configuration and calling of remote operations.

Resistance to the weather conditions

Due to the industrial environment, the communication module has a wide operating temperature range from -40° C to + 70° C

GUI Application

WWAN Interfaces

- GSM / GPRS / EDGE: 900/1800, MHz
- UMTS(WCDMA): 900/2100 MHz, FDDBand (8,1)
- LTE: 800/900/1800/2100/2600 MHz, FDD-Band (20,8,3,7),TDD (38)
- LTE Cat. 1 (3GPP release 11)
DL: max. 10 Mbps, UL: max. 5 Mbps, 2x2 DL MIMO
- LTE Cat.3
DL: max. 100 Mbps, UL: max. 50 Mbps, 2x2 DL MIMO
- LTE Cat.4 (3GPP release 11)
DL: max. 150 Mbps, UL: max. 50 Mbps, 2x2 DL MIMO
- HSPA+ DL Cat.24 / UL Cat. 6, Dual Carrier
DL: max. 42 Mbps, UL: max. 5.76 Mbps
- UMTS
DL: max. 384 kbps, UL: max. 384 kbps
- EDGE Class 12 data rates
DL: max. 237 kbps, UL: max. 237 kbps
- GPRS Class 12 data rates
DL: max. 85.6 kbps, UL: max. 85.6 kbps
- CSD

Local Interfaces:

- RS-232
- RS-485
- Up to 4 input ports and output ports
- USB 2.0 Device (mini USB)

SIM/USIM

- Up to 2 SIM/USIM card or Mini SIM (2FF in accordance with the ISO / IEC 7810: 2003 standard, ID-000)

Zarządzanie

- local and remote: KZUT (Service Application GUI) and CLI,
- group: dedicated system DGT EMS TRAM,
- SNMPv2c,
- TR-069.

Remote access to serial ports

UDP, TCP (RFC2217, Cisco)

Other

- Logs System & Statistics
- LED signaling

Resistance to the external conditions:

- Lack of the active cooling or heating elements
- operates in the temperature range from -40° C to +70° C
- humidity – to 90%

Power supply:

- DC 12 - 16V or according to customer requirements
- 'Last gasp' functionality

Aerial sockets

- 1-2 sockets for WWAN,
- 1 GPS antenna socket

Technical Specification



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