



**3GPP**

**HSPA+ DC**

**LTE**

**CDMA2000**

**Fast Ethernet**

**DHCP**

**RS-232/485/422**

**working temperatures range:  
from -30°C to +60°C**

**IP51**

**GUI**

**Management System**

**SJA - IP (Mobile IP)**

**Porty I/O**

**Remote access to serial port via UDP and TCP**

UMAD (*Universal Machine-to-Machine Access Device*) (Universal Machine-to-Machine Access Device) is a universal communication device for M2M applications, used in solutions where the data transmissions are carried out via cellular networks or other radio technologies. The device is equipped with several interfaces to various radio networks, which increases device's reliability and availability, by creating its independence from a failure or a momentary propagation problems within one of the active networks. The device automatically chooses the optimal data transmission channel.

When working with one radio technology, the increased reliability can be achieved using the solution that uses second SIM / USIM card (DualSim).

UMAD is designed for industrial use, in particular, is dedicated to communication in modern power networks. UMAD, when used in the balancing cabinet, provides the communication functions of with systems to other intelligent network (Smart Grid) devices: balancing counter, metering data AMI concentrator, Smart Grid modules using GSM / UMTS, LTE and CDMA2000 networks.

UMAD, the dedicated router, can be used in those applications where the reliable access to the data networks is essential. Smart Power Grid is one of many possible usages of the device. Various UMAD make it suitable for different environmental conditions.

### Interfaces

UMAD gives access to the radio network systems in standards: 3GPP (GSM / UMTS / LTE) and CDMA2000 (1xRTT / EV-DO rev. A and B). UMAD allows to select the CDMA2000 technology, or 3GPP as a primary one. Technology selected as a backup will be used when:

- there is no coverage via primary technology,
- signal level in falls down below the pre-defined threshold,
- primary technology module fails to operate.

From the LAN side, UMAD device has Fast Ethernet ports for general use (2 or 4). You can set a fixed IP address or with use of the built-in DHCP server.

### Reliability

In order to ensure high reliability in accessing the data network device can work:

- with different radio access technologies

simultaneously (3GPP, LTE and CDMA2000), automatically selecting the best technology available at any time (mode DualMode). The device can operate with one active connection, or with two active connections, in applications where even a temporary lack of communication is critical. The device uses the algorithms, for which the criteria for building the best connection path are radio parameters of available technologies. UMAD tests patency of the entire (end-to-end) transmission chain, not just radio propagation parameters.

- work using two SIM cards from different operators (primary and backup card), called DualSim. UMAD checks regularly and chooses the best (the fastest) radio service offered, basing on innovative algorithms implemented.

The device reliability is also achieved by the multi-level mechanisms for monitoring both hardware and software (watchdogs).

## Resistance to weather conditions

UMAD device is designed for operating in demanding climatic conditions:

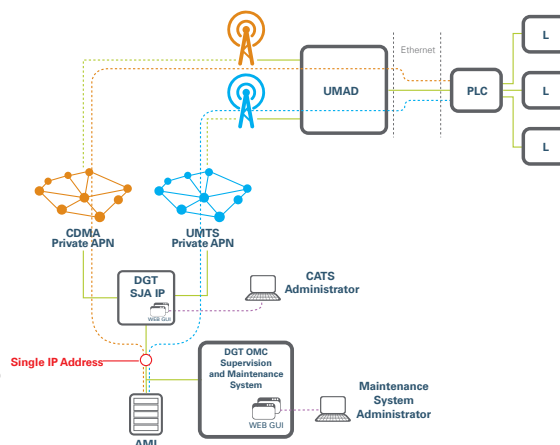
- in the temperature range from -30° C to + 60° C,
- in the relative air humidity up to 95%,
- device housing has tested and certified protection factor IP51,
- device has no active cooling and heating elements in order to increase the reliability.

## Management

The device is managed locally via graphical Web interface. Optionally, monitoring can be held by the management system that allows remote operations on a single device or on group of devices.

The management system enables:

- device configuration,
- software upgrades,
- restart,
- restoring the default settings,
- loading and saving the configuration settings,
- reading the software version, IP addresses, MAC address and device serial number,
- diagnostics,
- monitoring the transmission quality,
- monitoring how well the SLA transmission parameters are met.



## Unified IP Addressing System

The DGT SJA IP Unified IP Addressing software expands the functionality of the UMAD Communication Devices. Its goal is to provide the IT systems such as AMI, SCADA and infrastructure surveillance systems with ability of communicate with UMAD devices via the fixed IP addresses, regardless of the addresses granted dynamically by the mobile networks. The protocol used in the DGT SJA IP system is open, which makes possible the cooperation of this software with devices from various manufacturers. The DGT SJA IP Unified IP Addressing is scalable. The system functioning continuity is provided by redundancy. Server management, configuration and monitoring are available to the user through a web page.

Open protocol

Scalability

Redundancy

GUI

Technical specification

### WAN Interfaces

- GSM / GPRS / EDGE: 900/1800, MHz
- UMTS(WCDMA): 900/1800,/2100 MHz, FDDBand (8,3,1)
- LTE: 800/900/1800/2600 MHz, FDD-Band (20,8,3,7)
- CDMA2000 (1xRTT,EVDO rev.A,B): 450MHz/A/L
- dual (e.g. 3GPP with CDMA2000)
- LTE Cat. 3  
DL: max. 100 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
- CDMA2000 1xRTT:  
DL: 153 kbps UP:153kbps
- CDMA2000 1xEVDO rev.A:  
DL:max. 3.1Mbps UL:1.8Mbps
- CDMA2000 3xEVDO rev.B  
DL=14.7 Mbps UL:5.4Mbps

### Local Interfaces

- 2-4 Fast Ethernet (RJ45)
- RS232 (RJ45 or DB9)
- RS485 (RJ45/RJ12 / terminal block)
- up to 6 input ports (terminal block)
- 2 output ports (terminal block).

### SIM/USIM/R-UIM interfaces

- 2 x SIM/USIM card or
- SIM/USIM and R-UIM optional Embedded SIM

### Network protocols

- NAT
- DHCP client/server
- DHCP relay
- DMVPN
- NHRP
- RIP, RIP2, OSPF, BGP-4

### VPN

- DGT proprietary SJA IP

- IPSec, OpenVPN, GRE

### Security

- filtering: ports, MAC and IP addresses

### Remote access to serial ports

- serialOverIP: UDP,TCP (RFC2217, Cisco),

### Other

- port forwarding
- syslog
- notifications - SMS/USSD/mail/trap SNMP
- statistics
- LED signalling

### Management

- www
- SNMPv3
- TR-069
- DGT OMC
- SMS, USSD, CLIP control
- optional Telnet/SSH

### Resistance to environmental conditions

- lack of active cooling and heating parts,
- operating temperature -30 oC to +60 o
- IP51 case

### Input / Output ports

- 2 x two-state output port NO, - 100V/120mA, resistance 60 Ohm, ESD
- 6 x two-state input port IN, short circuit resistance 1200 Ohm, ESD
- opto-isolation of inputs and outpurs.

### Power supply options

- DC 24V
- single-phase AC 100-230VAC
- three-phase 100-230V with phase failure relay,
- optional battery backup and „dying gasp“ functionality

### Antenna interfaces

- 2, 3 or 4 SMA (female)

### Case

- ABS compound, self-extinguishing,
- dimensions: 170mm x 130mm x 59,5mm,
- Vertical or horizontal mounting,
- Wall mounting kit,
- Optional – DIN rail,
- Weight ~ 700g

