



MATRIX AMM

Smart Metering Integrated Solutions



About company

“Telecommunication technologies LLC” (Teletec™) is young fast-growing electronic company.

Teletec provides whole cycle of product development, including Design Engineering, Manufacturing, Quality control, Installation, System integration and Support.

Teletec’s Quality Management System was certified in 2005 according ISO9001 standard requirements.

Teletec has two own production facilities in Odessa, Ukraine, including SMT, THP, mechanical assembly, calibration and testing, quality control, packaging, etc.

At Teletec’s production facilities use modern high productivity automated technological equipment from Germany, USA, Great Britain, South Korea, Finland origin.

To meet Teletec’s products growing demand we started to place orders at the world's largest electronics manufacturer JABIL.

Teletec’s Design Engineering Department consists of two separate laboratories:

- Broadband Products & Network’s Solutions Laboratory;
- Resource Metering Products and Integrated Systems Laboratory.



Both laboratories provide complete product design engineering cycle, incl.

- customer’s requirements research;
- software & hardware development;
- prototype manufacturing;
- product testing:
 - magnetic;
 - electromagnetic;
 - radio wave influence;
 - climatic;
 - mechanic, etc.

Teletec exports to more than 40 countries worldwide, including the USA, Australia, Germany, Russia, Vietnam, Brazil, etc.

Teletec’s competitive advantages on the market:

- complete service and consulting;
- constant analysis of modern trends;
- regular upgrades and functionality extensions.

Our products are certified in main markets according international and national regulatory legislation.

Teletec’s Strategy - to grow ahead of the market

Teletec’s Goal - to meet the needs of tomorrow's customers.

Teletec
telecommunication tech

Matrix AMM integrated solution

Teletec presents its new Matrix AMM integrated solution for different types of customers.

Matrix AMM is modern turn-key integrated solution.

We can control, monitor and collect data from various types of power, water, gas and heat meters.

Matrix AMM is cost-effective scalable solution from Distribution Utility to residential customer.

Matrix AMM can be part of future Smart Grid infrastructure thanks to its powerful modern communication capabilities.

Matrix AMM uses a wide variety of digital communication interfaces:

- Power Line Communication PLC (FSK, S-FSK);
- Wireless Radio Feeder IEEE 802.15.4;
- RS 485;
- M-Bus (optional) ;
- GSM/GPRS;
- TCP/IP (LAN);
- IR-port (IEC61107).

Matrix AMM uses own Teletec and industrial open DLMS/COSEM protocols.

Teletec protocol library is free for AMM Solution integrator, software developers. It is cost-effective solution for small and medium sized customers.

Open protocol DLMS/COSEM based matrix AMM solution provides interoperability and easy integration to multi-vendor platforms.

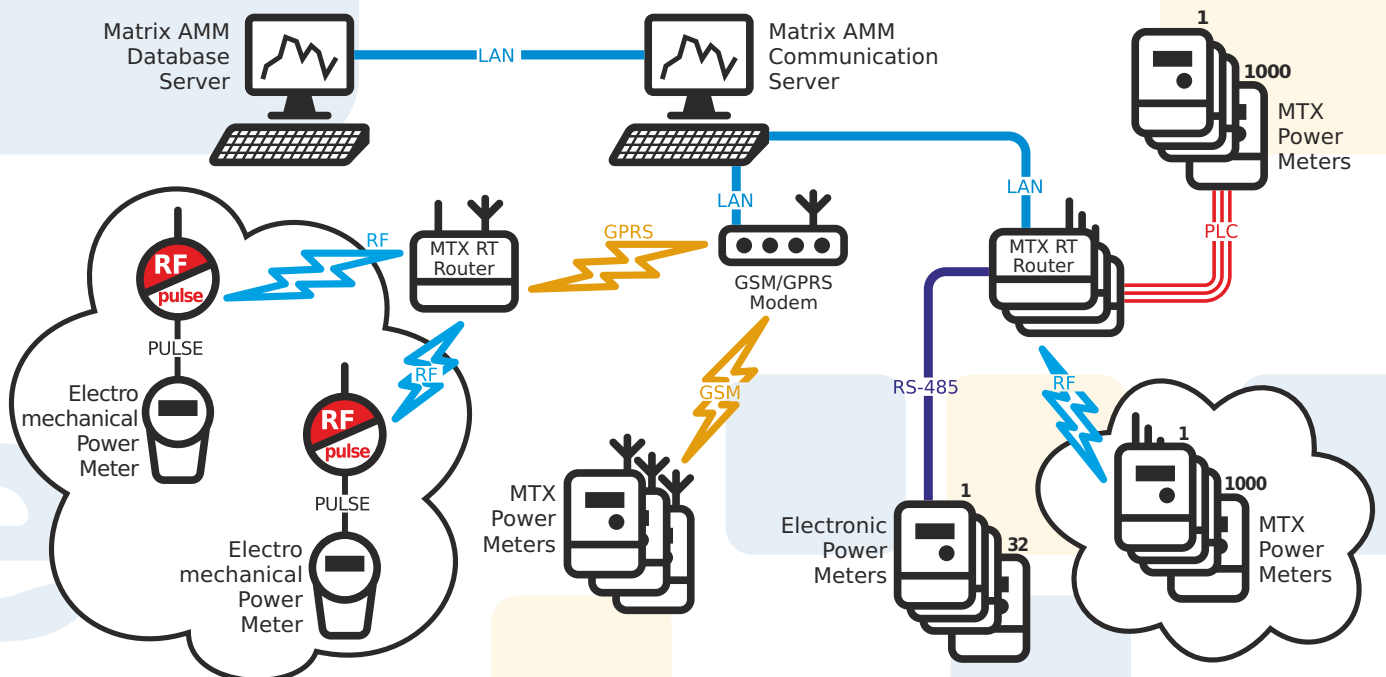
Matrix AMM solution is your easy smart metering and smart grids start.

Matrix AMM Distribution utility integrated solution

Matrix AMM provides metering data collection, configuration and control from MTX multifunctional meters and MTX RT routers-concentrators (see Scope of Matrix AMM components) via various communication interfaces and protocols:

- Power Line Communication PLC (FSK, S-FSK) from MTX meters;
- Wireless Radio Feeder IEEE 802.15.4 from MTX meters and adaptors;

- RS 485 from MTX meters and other manufacturer meters;
- M-Bus from other manufacturers meters(option);
- GSM/GPRS from MTX meters and MTX RT routers;
- TCP/IP (LAN) from MTX meters and MTX RT routers;
- IR-port (IEC61107) from all devices.



Matrix AMM DLMS/COSEM based Solution provides interoperability and easy integration to multi-vendor platforms.

Matrix AMM Solution is based on Linux OS, MySQL and support WEB-interface.

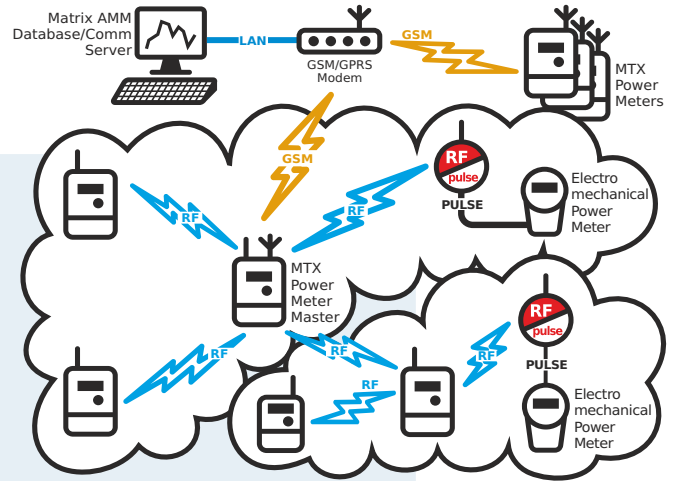
Matrix AMM Solution is scalable solution.

Matrix AMM Industry integrated solution

Matrix AMM provides metering data collection, configuration and control from MTX multifunctional meters and MTX RT routers-concentrators (see Scope of Matrix AMM components) via various communication interfaces and protocols:

- Power Line Communication PLC (FSK, S-FSK) from MTX meters;
- Wireless Radio Feeder IEEE 802.15.4 from MTX meters and adaptors;
- RS 485 from MTX meters and other manufacturer meters;
- GSM/GPRS from MTX meters and MTX RT routers;
- TCP/IP (LAN) from MTX meters and MTX RT routers;
- IR-port (IEC61107) from all devices.

Matrix AMM Solution provides fast and easy installation at industrial premises. We can use previously installed and new Matrix AMM components.



Application of wireless Radio Feeder, GSM/GPRS and PLC interfaces is the main advantage of Matrix AMM Solution.

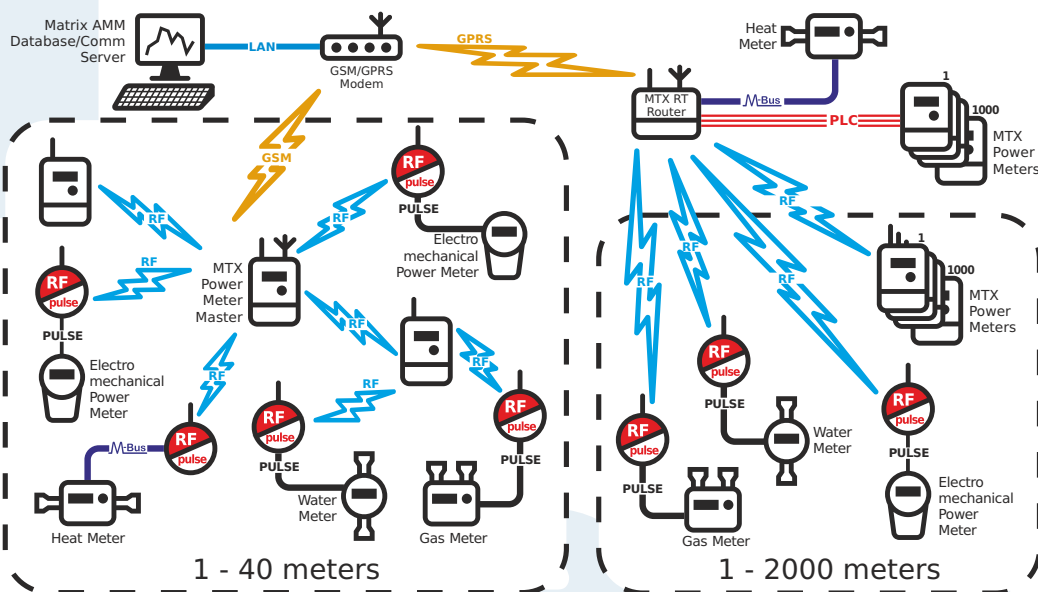
Matrix AMM Solution is based on Linux OS, MySQL and support WEB-interface.

Matrix AMM Home & building automation solution

Matrix AMM provides metering data collection, configuration and control from MTX multifunctional meters and MTX RT routers-concentrators (see Scope of Matrix AMM components) and data collection from Gas, Water and Heat meters via communication interfaces:

- Power Line Communication PLC (FSK, S-FSK) from MTX meters;
- Wireless Radio Feeder IEEE 802.15.4 from MTX meters and adaptors;

- RS 485 from MTX meters and other manufacturer meters;
- GSM/GPRS from MTX meters and MTX RT routers;
- TCP/IP (LAN) from MTX meters and MTX RT routers;
- M-Bus (option);
- Pulse output;
- IR-port (IEC61107) from all devices.



Matrix AMM Solution provides fast and easy installation at industrial premises. We can use previously installed and new Matrix AMM components.

Application of wireless Radio Feeder, GSM/GPRS and PLC interfaces is the main advantage of Matrix AMM Solution. It allows to avoid wire

connection and construction and repair works.

By using MTX power meter load connection/disconnection relay building managing company can control levels of subscriber payments and network load.

Matrix AMM Solution is based on Linux OS, MySQL and support WEB-interface.

Matrix AMM: Scope of Components

Single phase multi tariff meter MTX 1

The Single phase multi tariff watt-hour meter MTX1 with internal real-time clock is a compact meter offering cost-effective, complex tariff functionality with enhanced features. An integrated, flexible programmer management capacity gives full Time Of Use (TOU) metering, eliminating the need for an external timing device.



Meter Type	Single phase multi-tariff watt-hour meter
Current sensors	Current circuit Neutral circuit
Accuracy Class/ Class Index	Class 1
Register	8 digits LCD
Tariffs	Up to 4 tariffs, 12 seasons, limit tariffs, special days, weekend & holidays
Network	1 phase 2 wire
Method of Measurement	measurement A+
Standards and Requirements	In accordance with EN62052-11, EN62053-21, EN62053-23, EN62054-21, EN50065-1 and DIN43857
Voltage	Un = 220 V Measuring range: -20 % to +15 % Un
Current	Starting current Ist ≥ 20 mA Reference currents Iref = 5 A Maximum current Imax = 40,60,80,100 A
Frequency	50 Hz ±1 Hz, 60 Hz ±1 Hz
Indicators	Forward energy indicated by red LED (2000 imp/kWh)
Degree of protection	IP51
Temperature ranges	Operating -30 ... +60°C LCD operating -20 ... +60 °C
Case	According DIN 43857 Transparent Terminal Block Cover
Material	Case - ABS (flame retardant v1), Polycarbonate (v1) Terminal block - PBT (v0)
Installation	DIN rail Screws
Dimensions (LxWxD)	177 x 125 x 64 mm
Weight	≤ 1 kg
Communication	Integrated modules (optional replaceable) PLC / RF wireless IEEE802.15.4(CENELEC A) /GSM/ LAN/RS485 / IR port IEC 61107
Load Management	Magnetic Latching Relay External Load Control relay Conform to Standards 255, IEC60065.
Protocol	Teletec, DLMS/COSEM compatibility, IEC 62056 optional
Real Time Clock	±5 sec/day, back up battery
Protection	Overvoltage Magnetic immunity with magnetic event detection and recording
Detection	Incorrect connection Radio waves influence
Event log	Extended history (logbook) function

Multi phase multi tariff meter MTX3 (Residential, Commercial)

The Multi-phase multi-tariff meters MTX 3 with internal real-time clock are intended for industrial, commercial and residential

consumption. Meters can support both prepayment and credit operation modes.

Meter Type	Three Phase Multifunctional Energy Meter (multi tariff watt-hour meter)
Current sensors per phase	Current circuit Neutral circuit
Accuracy Class/Class Index	Class 1 0.5S-2.0
Register	8 digits LCD
Tariffs	Up to 4 tariffs, 12 seasons, limit tariffs, special days, weekend & holidays
Network	3 phase 6 wire
Method of Measurement	measurement A_{\pm} , R_{\pm}
Standards and Requirements	In accordance with EN62052-11, EN62053-21, EN62053-23, EN62054-21, EN50065-1 and DIN43857
Voltage	$U_n = 3 \times 220V/380V$ Measuring range: -20 % to +15 % U_n
Current	Reference currents: 10(85 max) A or 5(6 max) A
Frequency	50 Hz ± 1 Hz, 60 Hz ± 1 Hz
Indicators	Forward energy indicated by red LED (2000 imp/kWh)
Degree of protection	IP51
Temperature ranges	Operating -40 ... +60 °C LCD operating -20 ... +60 °C
Case	According DIN 43857 Transparent Terminal Block Cover
Material	Case - ABS (flame retardant v1), Polycarbonate (v1) Terminal block - PBT (v0)
Installation	DIN rail Screws
Dimensions (LxWxD)	252x 275 x 80 mm
Weight	$\leq 1,5$ kg
Communication	Integrated modules (optional replaceable) PLC / RF wireless IEEE802.15.4(CENELEC A) /GSM/ LAN/RS485 / IR port IEC 61107
Load Management	Magnetic Latching Relay External Load Control relay Conform to Standards 255, IEC60065.
Protocol	Teletec, DLMS/COSEM compatibility, IEC 62056 optional
Real Time Clock	± 5 sec/day, back up battery
Protection	Overvoltage Magnetic immunity with magnetic event detection and recording
Detection	Incorrect connection Radio waves influence
Event log	Extended history (logbook) function



Interface converters

MTX IU ZB/P

- External pulse/RF wireless converter
- Power supply: 220 V
- Transmission power: 5 mW
- Frequency range 2.4 GHz
- IEEE 802.15.4 standard compatible

- Transfer range: up to 30 m (building inside), up to 150 m (building outside)
- 16 retransmission levels
- Installation: terminal block's cover
- Optionally equipped with RTC, Backup Battery, load switch on/off relay



MTX IU RF

- Built-in UART/RF wireless converter
- RF net data exchange
- Frequency range 2.4 GHz
- IEEE 802.15.4 standard compatible

- Transfer range: up to 30 m (building inside), up to 150 m (building outside)
- 16 retransmission levels
- Installation: MTX power meters



MTX IU PLC

- Built-in UART/PLC converter
- PLC net data exchange LV 0.4kV
- EN 50065 (CENELEC A 70-95 kHz),
- IEC 61000-3 standards

- Transfer range: up to 550 m
- 16 retransmission levels
- Installation: MTX power meters



MTX IU RF + battery

- External pulse/RF wireless converter
- RF net data exchange
- Frequency range 2.4 GHz
- IEEE 802.15.4 standard compatible

- Transfer range: up to 30 m (building inside), up to 150 m (building outside)
- 16 retransmission levels
- Installation: water, gas meters
- Battery life: 10 years



Multi phase multi tariff meter MTX 3 (Industrial)

The Multi phase multi tariff meter MTX 3 with internal real-time clock are intended for generation, transmission, distribution, industry tasks.

Meter Type	Three Phase Multifunctional Energy Meter (multi tariff watt-hour meter)
Current sensors per phase	Current circuit Neutral circuit
Accuracy Class/Class Index	0.2S-1.0 0.5S-2.0 reactive
Register	8 digits LCD
Tariffs	Up to 4 tariffs, 12 seasons, limit tariffs, special days, weekend & holidays
Network	3 phase 6 wire
Method of Measurement	measurement $A \pm$, $R \pm$ four quadrants
Standards and Requirements	In accordance with EN62052-11, EN62053-21, EN62053-23, EN62054-21, EN50065-1 and DIN43857
Voltage	$U_n = 3 \times 57,7/100-3 \times 240/415$ V
Current	Reference currents:5 (10) A
Frequency	50 Hz $\pm 2,5$ Hz, 60 Hz $\pm 2,5$ Hz
Indicators	Forward energy indicated by red LED (2000 imp/kWh)
Degree of protection	IP51
Temperature ranges	Operating $-40 \dots +60^\circ\text{C}$ LCD operating $-20 \dots +60^\circ\text{C}$
Case	According DIN 43857 Transparent Terminal Block Cover
Material	Case - ABS (flame retardant v1), Polycarbonate (v1) Terminal block - PBT (v0)
Installation	DIN rail Screws
Dimensions (LxWxD)	252x 275 x 80 mm
Weight	$\leq 1,5$ kg
Communication	Integrated modules (optional replaceable) 2 x RS485 IR port IEC 61107
Load Management	Magnetic Latching Relay External Load Control relay Conform to Standards 255, IEC60065.
Protocol	Teletec, DLMS/COSEM compatibility, IEC 62056 optional
Real Time Clock	± 5 sec/day, back up battery
Protection	Overvoltage
Detection	Incorrect connection Radio waves influence
Event log	Extended history (logbook) function



Router/Concentrator MTX RT

ROUTER/CONCENTRATOR MTX RT is the basis of MATRIX AMM communication subsystem.

MTX RT Router provide data exchange between MTX power meters or MTX interface converters and Matrix AMM DATABASE SERVER.

It allows read, collect information and data from multiple meters and forwarding them to the utility.

MTX RT Router installation site is two transformer substation 0,4KV or electrical connection to the building.

Communication capabilities

Communication channel between Server and Router

- GSM/GPRS;
- LAN.

Communication channel between Router and Meters

- PLC (Power Line Connection 0.4 kV, Teletec S-FSK, FSK);
- RF IEEE 802.15.4, 2,4 GHz;
- RS485;
- M-Bus (optional).

Functional capabilities

- Different bus section Power Supply automatic switching;
- OS Linux;
- Several replaceable interface converters;
- USB port;

- SIM-Card holder;
- Battery Supply;
- IP54.

Main benefits

- new meters automatic detection;
- multi way communication with smart meter;
- data collection in two poll modes (scheduled, on-demand);
- event log;
- remote smart meters management and configuration.





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