Architecture and Technologies for Smart metering and gas smart grid

October 2017

HM Industrial/Commercial smart meter 10-40 m3/h

- HM10 – HM16 – HM25
- Synthetic diaphragm gas meter
- Electronic display
- Open protocol: UNI-TS11291
- Tm: -25°C…..+55°C
- Class of precision = 1,5
- Pressure compensation
- Temperature compensation
- Certificate for approval 2004/22/CE
- In conformity with EN1359:1998
- In conformity with OIML
- GPRS comm module
- Metrological battery life: 15 year
- Comm module battery life: 5/7 Years
- No need of P and T connection on pipe

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RSE Residential smart meter 4-10 m3/h

- RSE1,6 - RSE2,5 – RSE4 – RSE6
- Synthetic diaphragm gas meter
- Electronic display
- Open protocol: UNI-TS11291 (DLMS)
- Tm: -25°C…..+55°C
- Class of precision = 1,5 (1 with TC)
- Internal valve
- Temperature compensation
- Certificate for approval 2004/22/CE
- In conformity with EN1359:1998
- In conformity with OIML
- GPRS, 169 or 868 MHz comm module
- Metrological battery life: 15 year
- Comm module battery life: 7-15 Years

Main Features

- Based on the latest generation of smart meters communicating by means GSM or 868MHz LAN networks ;
- Meter: available up to 10 mc / h (also with "class 1");
- Meter: temperature compensation integrated
- Meter: ATEX certified for installation in hazardous area (Zone 2)
- Communications between meter and SAC through a dedicated interface (FEC) deployable in the Information System of GasCo
- **The system supports "Hybrid" functionality mode: pre-payment and post-payment** *;
- High reliability and security (communications protected by 128-bit encryption keys);
- Secure management of the claim (eg .: in case of End User discontinuance);
- Ability to inhibit the supply outage during public holidays;
- Manage the loan;
- Notices to the Customer when credit is under threshold and out;
- Fiorentini offers the system with the formula "make" or "buy" ** including maintenance service

** Traditional, with reading and outputting bill*

*** Purchase of the system and autonomous management (make); service purchase (buy)*

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CARDLESS PRE-PAYMENT SYSTEM

SAME RSE METER
FOR PRE-PAYMENT AND POST PAYMENT

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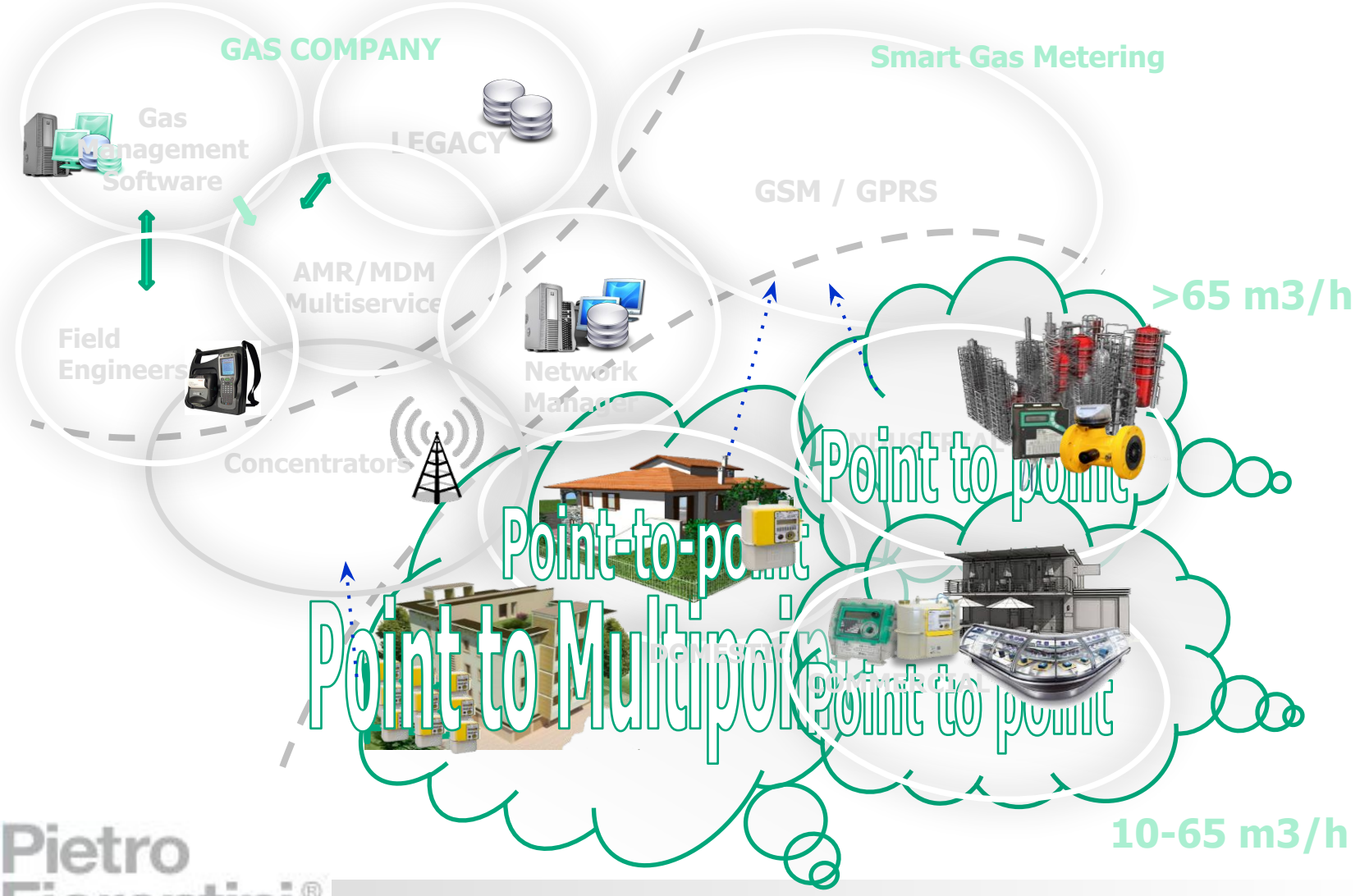
SAMGAS

A Smart metering typical Architecture



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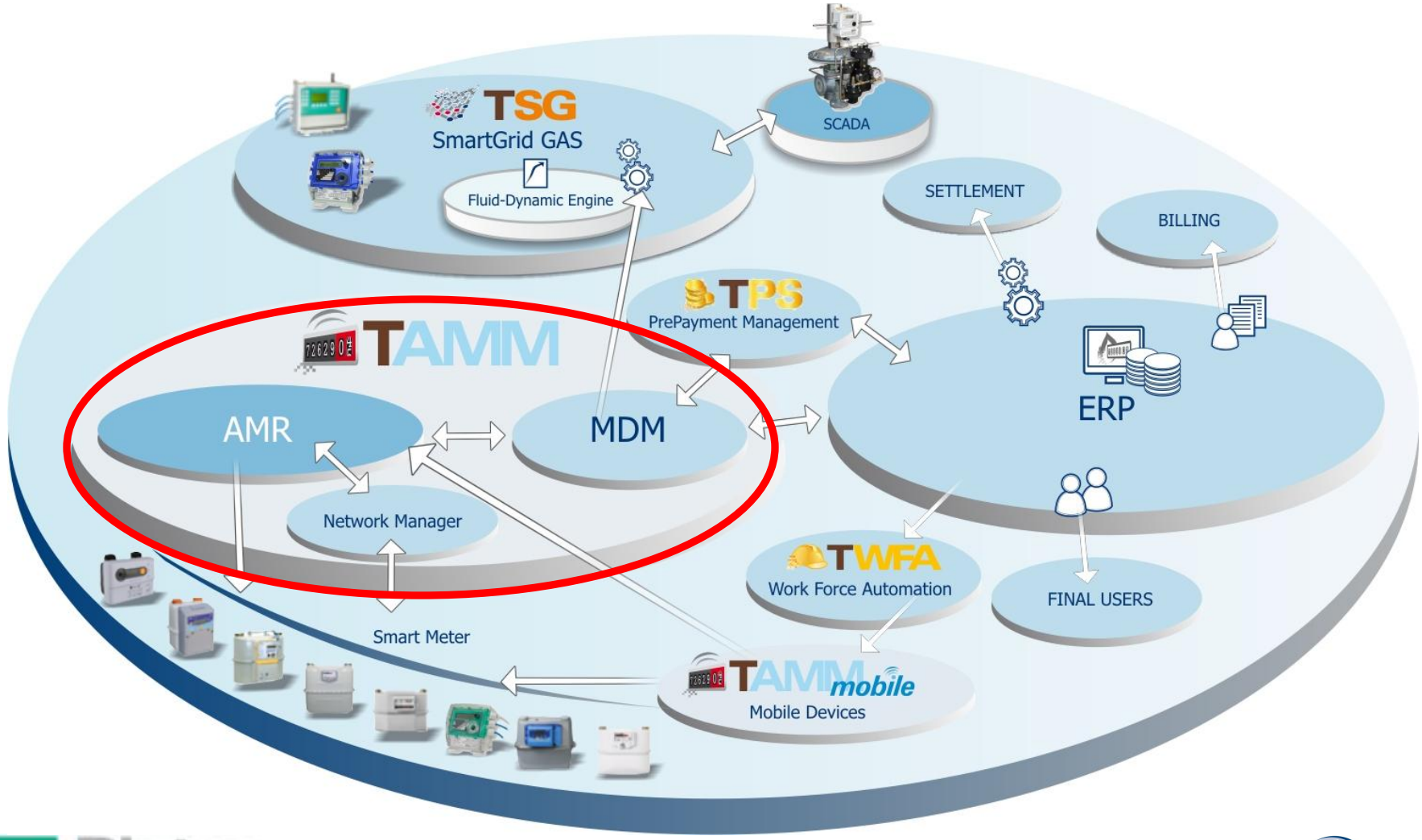
Smart metering: AMM layer



TAMM Meter management software

TAMM contains components for the management of an advanced metering infrastructure, the solution includes the presence of 3 main components called:

- **MDM** (Meter Data Management)
- **AMR** (Automatic Meter Reading)
- **NM** (Network Manager)

TAMM: Advanced Meter Managment

The **MDM** is responsible for following processes:

- ☐ Master data for Measure groups
- ☐ Data and metadata for measurements and consumption
- ☐ Alarm management
- ☐ Event visualization
- ☐ Diagnostic equipment

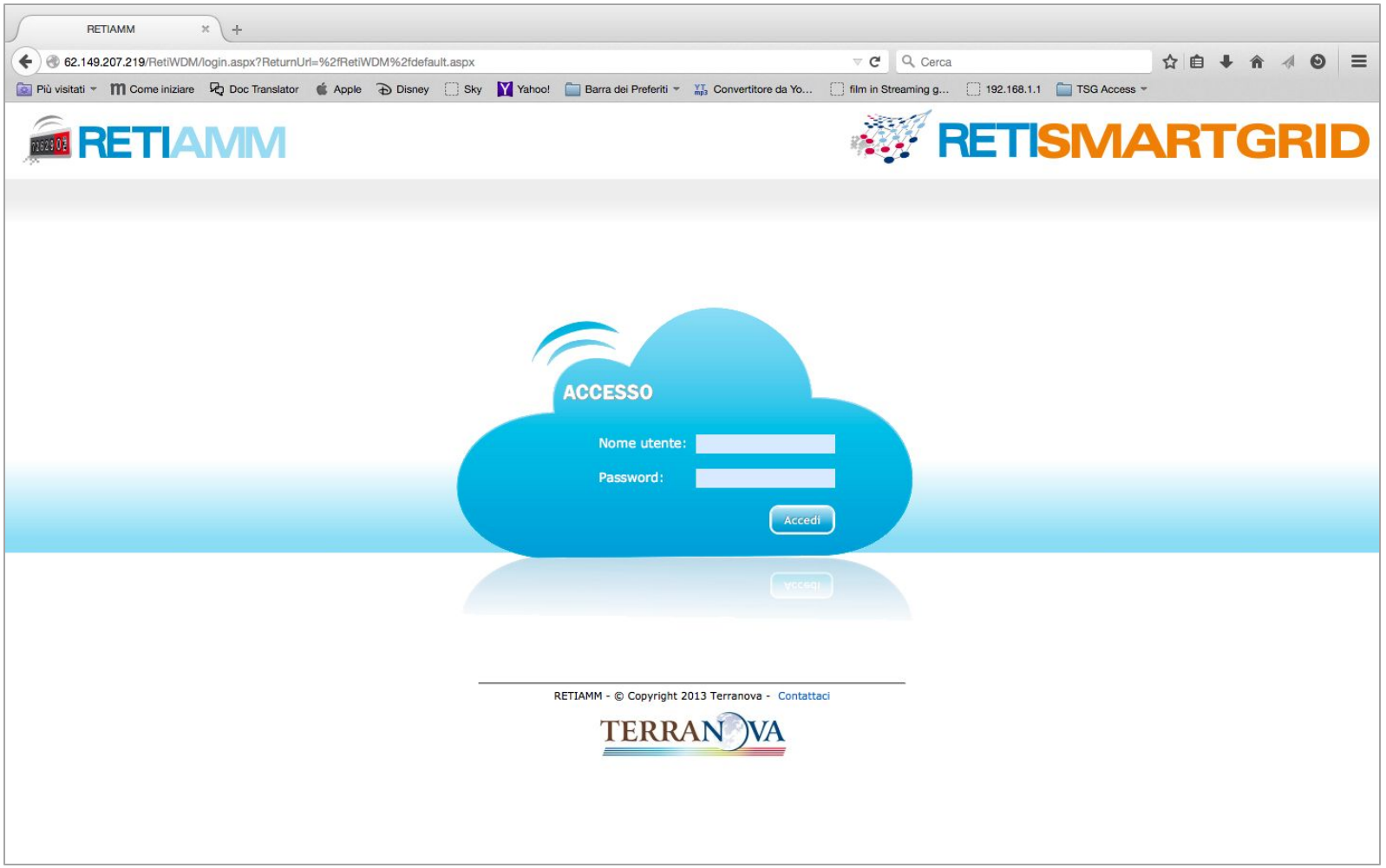
The **AMR** is responsible for following processes:

- ☐ Data Collection
- ☐ Management of the main meters

The **NM** is responsible for following processes:

- ☐ Main concentrator management
- ☐ Automatic network management, with forcing possibility (maintenance, troubleshooting, etc.)
- ☐ Collection of meter data without decoding

A flexible web solution (cloud or in house)



TSG – OPC Data exchange protocols

OPC Unified Architecture (OPC UA) is an industrial M2M communication protocol for interoperability developed by the OPC Foundation.

The Foundation's goal for this project was to provide a path forward from the original OPC communications model (namely the Microsoft Windows only process exchange COM/DCOM) to a cross-platform service-oriented architecture (SOA) for process control, while enhancing security and providing an information mode

TSG – ICCP Data exchange protocols

The Inter-Control Center Communications Protocol (ICCP or IEC 60870-6/TASE.2) is being specified by utility organizations throughout the world to provide data exchange over wide area networks (WANs) between utility control centers, utilities, power pools, regional control centers

ICCP is also an international standard: International Electrotechnical Commission (IEC) Telecontrol Application Service Element 2 (TASE.2).