Hexing MDC System

Protect Your Revenue
Contents

- System Overview
- Key Technologies
- Main Application
What problems can MDC system solve?

- Remote meter reading (AMR)
- Remote meter programming
- Extended metering — Water metering, Gas metering
- Sub-metering
- Tampering management & Event notification
- Provides metering data for line loss analysis
- Load profile & load control
- Remote tariff programming — including Step, TOU...
- Data collect for transformer monitoring device
We provide a integrated MDC system
Key Features

- Integrated system
- Whole scope load balance
- Well design HEAD-END platform
- Enhanced supports for operation maintenance
Key Features

Integrated System

1. Managed object including (1) HV gate meter, (2) smart circuit breaker, (3) (~10kv) HV meter, (4) LV meters, (5) network products, (6) LCU ...

2. Core applications:
   - Metering data collection
   - Asset management
   - Power quality monitoring
   - Transformer monitoring
   - Load management
   - Tampering management (Line loss analysis and control)
   - Smart pay (AMI + Prepayment)
   - VEE (core component of MDM)
   - Interface service
Key Features

Whole scope load balance

- HEAD-END, DB, Web Application, all support cluster
- Support huge scale of meters
- Support high concurrency with high performance

Well design HEAD-END platform

- Advanced HEAD-END architecture design
- Rich protocols supported: DLMS, ANSI, DCSML, DNP3, IEC60870-5-101, IEC60870-5-104…
- Modular driver model for meter & DC
Key Features

Enhanced supports for operation maintenance

- Device auto discovery & registration
- Supervision of communication flow;
- Supervision of data collection quality;
- Supervision state of system components.
Contents

• System Overview
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Physical Architecture

Background Process:
1) batch operation task
2) Missing rereading
System Integration

CIM based Enterprise Business Bus
( SOA, IEC61968, 61970, 61850 )

MDM-MDC integration points:
1) Install / replace meter
2) Meter reading
3) Events reading
4) Load control
Independent HEAD-END Technology

**Unified Access**

**Communi Scheduler**

**Protocol resolve Business process**

Firewall

Load Balancer

DB
Installation Technology

Automatic Install & debug

ERP → Install Form → Engineer 1 → DC → Engineer 2

Auto-discovery → PLC / RF

First msg: Detect meter type

Power on → Auto-config → AMI

www hxgroup cn
Auto-Periodic Meter Reading

Template

Consumer Category

Meter Type

Template (Auto) Apply

- Interval & activate configurable
- Data item is configurable
- Meter-Read-Time is dispersed
- Asynchronous, high concurrency
- Auto-Reread when network failed

0

1

2

3
Monitoring of Whole System

- Daemon for each Gate of HEAD-END;
  Event notified to administrators
- Real time monitoring for Components: Gate, Scheduler, BP, DB, Web Application, Interface Service
- Operation report send to administrator at 7:00 AM
Remote Communication Technology

- GPRS/CDMA, internal module, external module
- SMS
- CSD
- GPRS/CDMA, On-demand on-line (Period-on + SMS wake up)
- Optical fiber
- Ethernet (external module)
Network Plan for Residential

GPRS Meters

Applicable Scenario

- Residents widely dispersed, PLC signal is not good
- VIP residents, example: 3 phase consumers
- AMI network performance is highly required.
Network Plan for Residential

DC + PLC + Meters

Applicable Scenario
- Power grid suitable for PLC;
- Residential district;
- Rural house.

Technical Parameters
- Nodes supported by DC: 1024;
- Max distance: 3000 m;
- Average response time between DC & meter: 15 seconds.
Network Plan for Residential

DC + RFmesh + Meter

Applicable Scenario

- Power grid is complex, not suitable for PLC.
- Example: Old district.
Network Plan for Residential

Collector + 485 + Meters

Applicable Scenario

- Power grid is complex
- Harmonic disturbance
- Wireless signal attenuation
- Meter installation is central
- Example: district, shopping mall...
Network Plan for Residential

DC + RFmesh Collector + 485

Applicable Scenario

- Power grid is complex
- Meter installation is central
- high-rise residential building
- shopping mall
## Cost Comparison for GPRS Communication

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Security Mechanism

- RBAC
- Data access control
- IP/MAC restrictions
- Traceability

- Firewall
- Anti-virus
- Security of passwords

- AES-GCM
- Soft or hardware ciphering
- Meters connect to certain IP

Master Station

Operators

User
Contents

• System Overview
• Key Technologies
• Main Application
Application

- Load Control
- Transformer Monitoring Supporting
- GIS
- Operation & Maintenance
Meter Reading for Line Loss Analysis
Alarm/Event Management

- GPRS meter or DC event notification
- Events reading & Management
- Events Analysis & Handling – (Anti-tampering)
Load Control

Device

AMI Meter

- For residents: Internal relay
- C&I: Internal relay control External circuit breaker

Smart-pay Meter

- Similar to AMI meter. Provides prepayment functions.

LCU

- LCU — Managed by concentrator through PLC

C&I Metering Cabinet

CIU or IHD
Load Control

Master Station

- Remote connect/disconnect - single or multiple or by group
- Load control parameters download, meter activate
- Real time load profile to display load control result
Load Profile & Load Control

- Load profile programming using template
- Load curve data for region, transformer area, or single measure-point
- Direct load control
- Parameterized load control – by load or circuit limit
Events Reading for Outage Analysis

- Outage information collection – by Events
- Outage reports, by month or year
- Provides power supply reliability indicator
- Supports indicators : SAIFI, CAIFI, CAIDI, SAIDI
Transformer Monitoring Support

Operating States
Real-time Monitoring
- Voltage, Current
- Active, Reactive load
- Energy indicator
- Oil temperature, Oil level
- Branch status

Operating Security Evaluation
- Over load
- Three phase unbalance
- Phase missing

Economical Analysis
- Line loss analysis
- Reactive compensation

Power Quality Analysis
- Voltage qualification rate
- Harmonic analysis

Reliable
Economical
Safety
GIS

Abnormal Meter List

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Transformer information

- Meter No.: 000020130524
- Transformer No.: TF0001
- Transformer Capacity: 100kVA
- Installation Address: TF0001
- Alarm Name: A Phase Over-voltage End

Status Monitor
System Operation Supervision

- **Daily analysis**
- **Week bulletin**
- **Month score**
- **Year appraisal**

**Install**
- Installation Coverage Rate

**Operation**
- Data Integrality
- Communication success-rate

**Maintenance**
- Alarm Handling Rate

**Application**
- Metering Data Application Rate