WIND TURBINE SUPERVISION & CONTROL

SR100 SUPERVISION RELAY IS A INTENDED TO MONITOR AND PROTECT ELECTRICAL EQUIPMENT AGAINST COMMON FAULTS ON SINGLE-PHASE OR THREE-PHASE ELECTRICAL POWER NETWORKS. SR100 IS MONITORING ALL IMPORTANT PARAMETERS OF THE ELECTRICAL NETWORK IN BOTH DIRECTIONS (GENERATOR TO CONSUMER AND VICE VERSA) AND DETECTS POTENTIAL FAULTS ON THE ELECTRICAL EQUIPMENT AND INFORMS THE USER ABOUT THEM. FOR REAL-TIME COMMUNICATION CAN/CANOPEN INTERFACE IS BUILD INSIDE SR100 WHICH TRANSFERS POTENTIAL FAULTS TO THE USER SYSTEM (SCADA, ...) WITH MILLISECONDS RESPONSE RESOLUTION. **SR100** IS INTENDED TO PROTECT THE CONSUMERS ON THE ELECTRICAL NETWORK AGAINST UNATTENDED FAULTS WHICH COULD OCCUR (UNDERVOLTAGE, OVERVOLTAGE, UNDERFREQUENCY, OVERFREQUENCY, ASYMMETRY BY VOLTAGE, ASYMETRY BY PHASE, IMBALANCE, LOAD OVERRUN, LOAD UNDERRUN, PHASE SHIFT/ROCOF).

GENERAL PURPOSE CAPACITORS

CAPACITORS ARE BUILT IN RENEWABLE TECHNOLOGY. **DC LINK CAPACITORS** ARE USED IN INVERTERS/CONVERTERS WHERE HIGH PULSE INTERFERENCES ARE PRESENT . THEY ELIMINATED THE INTERFERENCE WHICH IS PRESENT IN DEVICES, FILTERING, SMOOTHING THE VOLTAGE AND STORING ELECTRICAL ENERGY.
AC FILTERING CAPACITORS ARE USED FOR INPUT/ OUTPUT FILTERING FOR POWER CONVERTERS, **SNUBBER CAPACITORS** ARE USED TO SUPPRESS TRANSIENT VOLTAGES IN APPLICATIONS WHERE THE SWITCHING IS TURNED OFF A LARGE SPIKE OR PEAK CURRENT GENERATED.
CAPACITORS CHARACTERISTICS ARE: SEAL HEALING PROPERTIES, HIGH RELIABILITY- LONG LIFE EXPECTANCY, LOW LOSSES, LOW EQUIVALENT SERIAL RESISTANCE, SMALL INFLUENCE OF DIELECTRIC, LOW PARASITE INDUCTIVITY AND THERMAL STABILITY.

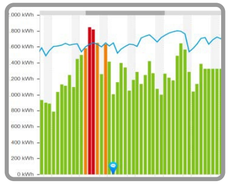
- DC LINK CAPACITORS KNG 2047, KNG 2048, KNG 3047, KNG 3048, KNI 5048
- SNUBBER CAPACITORS KNO 19AX, KNO 19BX
- AC FILTERING CAPACITORS KNI 4053, KNK 9053, KNK 3053

POWER FACTOR CORRECTION SYSTEMS

REACTIVE ENERGY RESULTS IN UNNECESSARY COSTS AND NEEDS TO BE COMPENSATED. THE COMPENSATION DEVICE DESIGNED SPECIFICALLY FOR COMPENSATION OF REACTIVE ENERGY CONSISTS OF AN POWER FACTOR CONTROLLER, A CONTACTOR AND CAPACITATOR BANKS. THE REACTIVE POWER FACTOR REGULATOR IS USED TO SWITCH THE BANKS ON AND OFF DEPENDING UPON THE STRENGTH OF THE NETWORK CURRENT AND THE REQUIRED VALUE, THUS COMPENSATING FOR THE REACTIVE POWER (ENERGY). ISKRA, D.D. IS CAPABLE OF SUPPLYING A COMPLETE SYSTEM, WITH OUR COMPANY PROVIDING POWER FACTOR CONTROLLER AND SUPPLYING THE ADJUSTOR, CONTACTORS AND THE CAPACITOR BANKS.

PRODUCT **PORTFOLIO**

MiEm
Energy Management



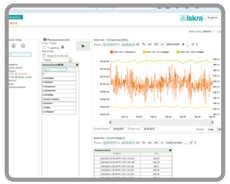
MiEM - THE ISKRA ENERGY MANGER

MiEM IS AN ESTABLISHED ENERGY MANAGEMENT SOFTWARE ENABLING THE FULLFILMENT OF THE COMPLETE ENERGY MANAGEMENT VALUE CHAIN UNDER ONE ROOF. IT IS A CLOUD-BASED ENERGY MANAGEMENT ANALYTICS SOFTWARE ENABLING ENERGY MANAGEMENT ORIENTED USERS TO REDUCE ENERGY USE AND COST ON THE LONG RUN. IT CAN CONNECT TO ANY TYPE OF MEASUREMENT DEVICE AND ENABLES THE FOLLOWING KEY FUNCTIONALITIES:

- **BILL TRACKING AND VALIDATION**
- **FISCAL METERING**
- **MONITORING AND TARGETING**
- **ANALYTICS & BENCHMARKING**
- **ALARMING & REPORTING**

THE **MiEM** SOFTWARE REPRESENTS THE KEY BUILDING BLOCK TO PROVIDING A COMPLETE SOLUTION SERVICE PACKAGE TO ISKRA'S END CUSTOMERS CONSISTING OF ENERGY RESOURCE CONSUMPTION ANALYSIS, METERING PROJECT, IMPLEMENTATION, CONTINUOUS ENERGY MANAGEMENT AND ISO 50001 COMPLIANCE CERTIFICATE.

MiSMART
Instrument remote monitoring



MiSMART - INSTRUMENT REMOTE MONITORING

THE **MiSMART** SERVER CENTRALLY COLLECTS INSTRUMENT DATA FROM MANY METER POINTS. IT IS PRIMARILY TARGETED FOR USE IN THE INDUSTRY AS WELL AS IN THE ENERGY DISTRIBUTION AND PRODUCTION SECTORS. THE SYSTEM COLLECTS ELECTRICAL ENERGY, GAS OR WATER CONSUMPTION DATA, AS WELL AS MANY OTHER POWER QUALITY (PQ) RELATED ELECTRICAL PARAMETERS (POWER, CURRENT, VOLTAGE, FREQUENCY, POWER FACTOR,...) THE SYSTEM ALSO INCLUDES ALARMS AND POWER QUALITY DATA WHICH ARE QUICKLY AVAILABLE TO ANY ENERGY MANAGER OR POWER QUALITY OPERATOR AND ENABLE:

- MEASUREMENT MONITORING PROVIDING THE MEANS FOR ELECTRICAL PARAMETER MONITORING ASWELL AS CONTROL OVER
- ELECTRIC ENERGY GAS/WATER CONSUMPTION AND LOSSES WITHIN THE COMPANY,
- ALARM MONITORING ENABLING MORE RELIABLE OPERATION AS WELL AS EQUIPMENT MAINTENANCE,
- STATISTICAL FUNCTIONS (HISTOGRAM, PERCENTILE, PEAK POWER, ALARMS, LOAD SYMMETRY) FOR BETTER EQUIPMENT INVESTMENT PLANNING BASED ON HISTORIC CONSUMPTION AND PQ DATA,
- PQ EVENT ANALYSIS AND REPORTING ACCORDING TO EN50160 AIMED AT IMPROVING ELECTRICAL POWER QUALITY ON THE LONG TERM,
- TABLE OR CHART DATA DISPLAYING,
- EXCEL AND PQDIF DATA EXPORTING,
- NETWORK DATA FILTERING AND COMPARING DATA FROM DIFFERENT METER POINTS,
- SUPPORTS OPC, SCADA STANDARD PROTOCOLS (IEC 60870-5-101/104), MODBUS/TCP DIRECT POLL.

Iskra®
Iskra, d.d.
Stegne 21
SI-1000 Ljubljana, Slovenia
Phone: +386 (0) 1 51 31 000
www.iskra.eu

• Published by Iskra, d. d. • Version 2.0 April 2017

WIND TURBINE PROGRAMME

- WIND TURBINE SUPERVISION **PROTECTION & CONTROL EQUIPMENT**
- **POWER QUALITY & ELECTRICAL PARAMETER** MONITORING INSTRUMENTS
- **ENERGY MANAGEMENT**, TURBINE REMOTE MONITORING &
- ALARM SUPERVISION SOFTWARE
- **POWER FACTOR CORRECTION** SYSTEMS
- **CAPACITORS** FOR GENERAL PURPOSE

Iskra®

PRODUCT **PORTFOLIO**

PROTECTION RELAYS

THE SUPPLY OF ELECTRICAL ENERGY OCCUPIES AN IMPORTANT POSITION IN THE LIFE OF MODERN SOCIETY. OPERATION OF COMMERCE, INDUSTRY, TRANSPORT, HEALTH SERVICE AND PRIVATE HOUSEHOLD ARE ALL DEPENDENT ON REGULAR AND DEPENDABLE SUPPLY OF ELECTRICAL ENERGY. THE QUALITY OF SUPPLIED ELECTRICAL ENERGY ALSO DEPENDS ON INFORMATION ABOUT THE STATE OF POWER SYSTEM. A SUCCESSFUL POWER SYSTEM OPERATION THEREFORE REQUIRES THE USE OF STATE-OF-THE-ART SECONDARY EQUIPMENT, WHICH ENABLES PROTECTION, MONITORING, SUPERVISION AND CONTROL OF INDIVIDUAL DEVICES AS WELL AS WHOLE POWER SYSTEM.

POWER QUALITY ANALYSER

THE **POWER QUALITY ANALYSER** CAN BE USED AS A STANDALONE PQ MONITORING DEVICE FOR DETECTION AND ANALYSIS OF LOCAL PQ DEVIATIONS, TRANSIENTS, ALARMS AND PERIODIC MEASUREMENTS. FOR THIS PURPOSE IT IS NORMALLY POSITIONED AT THE POINT-OF-COMMON-COUPLING (PCC) OF INDUSTRIAL AND COMMERCIAL ENERGY CONSUMERS TO MONITOR QUALITY OF DELIVERED ELECTRIC ENERGY OR AT MEDIUM OR LOW VOLTAGE FEEDERS TO MONITOR, DETECT AND RECORD POSSIBLE DISTURBANCES CAUSED BY OPERATION OF CONSUMERS. IDENTIFYING RELEVANT FIXED MEASURING POINTS IS THE MOST IMPORTANT TASK PRIOR TO COMPLETE SYSTEM INSTALLATION. THE IMPLEMENTATION OF A PQ SYSTEM ITSELF WILL NOT PREVENT DISTURBANCES IN NETWORK BUT RATHER HELP DIAGNOSE THEIR ORIGINS AND EFFECTS BY COMPARING AND SCRUTINIZING DATA FROM MULTIPLE TIME SYNCHRONIZED MEASUREMENT POINTS.

METERING EQUIPMENT

THE METERS ARE INTENDED FOR MEASURING, ANALYSING AND MONITORING SINGLE-PHASE OR THREE-PHASE ELECTRICAL POWER NETWORK. THE METER MEASURES RMS VALUE ACCORDING TO THE PRINCIPLE OF FAST SAMPLING OF VOLTAGE AND CURRENT SIGNALS. A BUILT-IN MICROPROCESSOR CALCULATES MEASURANDS (VOLTAGE, CURRENT, FREQUENCY, ENERGY, POWER, POWER FACTOR, THD PHASE ANGLES, ETC.) FROM THE MEASURED SIGNALS.

ENERGY METERS FOR RAIL MOUNTING ARE INTENDED FOR ENERGY MEASUREMENT IN INDUSTRIAL ENVIRONMENTS. THEY CAN PROVIDE INFORMATION ABOUT ENERGY CONSUMPTION IN PRODUCTION PLANTS. THEY ARE MICROPROCESSOR CONTROLLED, CAN COMMUNICATE WITH PC AND CAN HAVE TARIFF INPUTS. CURRENT INPUTS CAN BE UP TO 125 A. PROTECTIVE COVER FOR THEIR TERMINALS CAN BE SEALED, PREVENTING UNAUTHORIZED ACCESS. FAMILY OF ENERGY METERS WS X10X IS APROVED BY PTB ACCORDING TO MID DIRECTIVE. ACCURACY OF THE METERS IS CLASS 1, ACCORDING TO THE STANDARD EN 62053-21 FOR ACTIVE ENERGY METERS.

OVERVOLTAGE PROTECTION SWITCHES

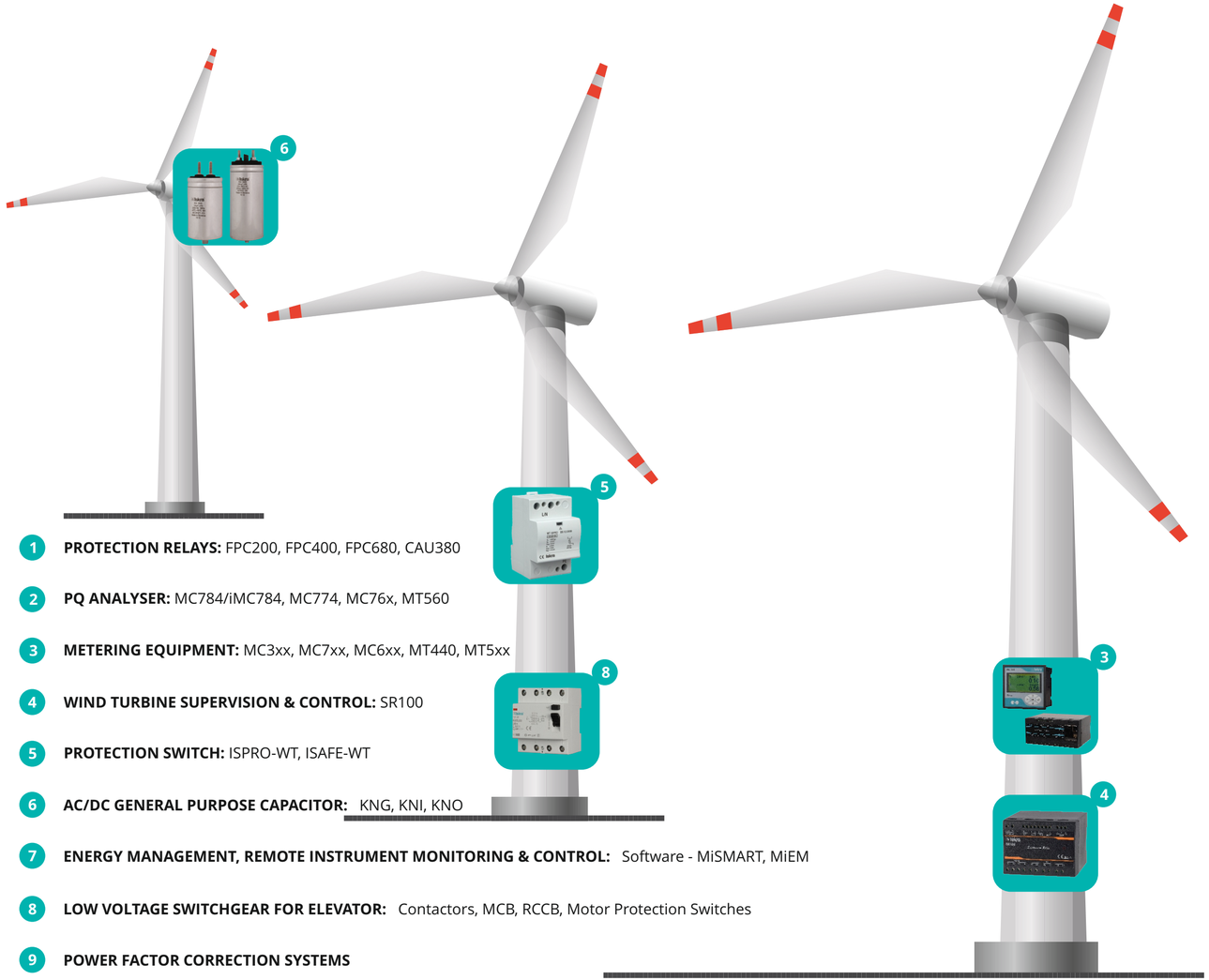
SOLUTIONS WHICH WE ARE PROVIDING ARE MADE WITH ONLY ONE PURPOSE: TO ASSURE YOU AND YOUR CUSTOMERS 100% SAFETY AND RELIABILITY OF THE WR SYSTEMS. WE BELIVE YOU ARE JUST NOW LOOKING AT PRODUCTS WHICH ARE ON THE LEADING EDGE OF SPD TECHNOLOGY.

OUR PRODUCTS FULLY MEET OBLIGATIONS BY IEC STANDARDS AND ALL NEEDS REQUESTED BY INVESTORS IN WT. YOU WANT RELIABILITY, LESS SERVICE COSTS, SAFETY AND COSTOMIZED INSTALLATION.

OUR ANSWER ARE ISAFE PRODUCTS.

YOU WILL ALWAYS GET SOLUTIONS BY LATEST STANDARDS AND SAFETY REQUIREMENTS.

RANGE OF **APPLICATION**



1. **PROTECTION RELAYS:** FPC200, FPC400, FPC680, CAU380
2. **PQ ANALYSER:** MC784/iMC784, MC774, MC76x, MT560
3. **METERING EQUIPMENT:** MC3xx, MC7xx, MC6xx, MT440, MT5xx
4. **WIND TURBINE SUPERVISION & CONTROL:** SR100
5. **PROTECTION SWITCH:** ISPRO-WT, ISAFE-WT
6. **AC/DC GENERAL PURPOSE CAPACITOR:** KNG, KNI, KNO
7. **ENERGY MANAGEMENT, REMOTE INSTRUMENT MONITORING & CONTROL:** Software - MiSMART, MiEM
8. **LOW VOLTAGE SWITCHGEAR FOR ELEVATOR:** Contactors, MCB, RCCB, Motor Protection Switches
9. **POWER FACTOR CORRECTION SYSTEMS**