UR – Selling Features

Selling Features

- **FAMILY** of relays built on a **common platform**
  - Common "look & feel" for ease of use product to product
  - All "bells & whistles", present and future, available to whole family
  - Reduced training time and drafting costs

- **MODULAR** architecture
  - Scaleable – accomodates a scaleable I/O architecture
  - Flexible – accomodates different **types** of I/O
  - Upgradeable – accomodates upgrading to new technologies

Selling Features

- **COMMUNICATIONS**
  - High-speed networking capability (Ethernet – fiber, redundancy)
  - Multiple Protocols – UCA 2.0, DNP 3.0, Modbus, IEC-870-101

- **SUBSTATION AUTOMATION - SYSTEM Solution**
  - PMCS + UR with UCA 2.0 MMS/Ethernet

Software Issues

- Software accounts for 90% of digital relay design
- Most support functions are required in all types of relays
- Time to Market requirements are driving shorter and shorter development cycles

Re-usable Software Modules are Essential for Success!

Hardware Issues

- uP / Integrated Circuit Functionality is increasing exponentially
- The hardware in a digital relay can become obsolete in 1 to 2 years
- Utility expectations are a 20+ year life

Modular Design Required to Keep Pace with New Technology and Provide Long Service Life

Universal Relay

- Expandable I/O
- Flash memory
- Draw-out modules: for serviceability
- Field Upgradable

User Interfaces

CONTACT INPUTS (expandable)

Configurable inputs may be used for:

- Breaker status
- Oscillography trigger
- Control inputs

CONTACT INPUTS (expandable)

- Trip rated Form-A relays
- Form-C relays that may be programmed for auxiliary functions

User Interfaces

PROGRAM UPDATING

- Flash memory storage of firmware for field updating via communications port. Enables product updating on-site for latest features

COMMUNICATIONS

- ModBus RTU on RS485 @ 115 kbps
- MMS/UCA 2.0 on Redundant 10BaseF

POWERFUL PROCESSORS

Numerical data processing using a 32 bit CPU and DSP for high speed complex task processsing

Metering

- Current (Ia Ib Ic In Ig)
  - accuracy: ± 0.25% from .1 to .2 pick up
- Voltage (Vab Vbc Vca Van Vbn Vcn)
- Apparent Power (VA)
  - accuracy: ± 1% of reading
- Real Power (W)
  - accuracy: ± 1%
- Reactive
  - accuracy: ± 1%
- Power Factor
  - accuracy: ± 0.02

Communications

Protocols

- Modbus RTU protocol
  - CPU: standard Front Port: RS232 and Rear Port: RS485 baud rate: 115kbps (6 times faster than 19200 bps)
- UCA2™ protocol
  - Aplication: MMS
  - Physical: 10BaseT (Ethernet) or 10BaseF (Fiber Optic)
  - Transport layer ISO-OSI and TCP/IP (Dual Media optionally available)

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