Managing Port Terminal Power Metering & Data Capture for Reefer Outlet Assemblies

ESL POWER SYSTEMS

Background

- Industry Background
- Evolution/standardization of Reefer Plugs/Outlet
- 180K+ Reefer Outlets in use worldwide

Size Really Does Matter

Larger container ships have arrived in the US

- SSA's Pacific Container Terminal (PCT), Long Beach, CA
- 18,000 TEU CMA CGM Benjamin Franklin (February 2016)
- 1500 Reefer Containers

Reefer Outlets

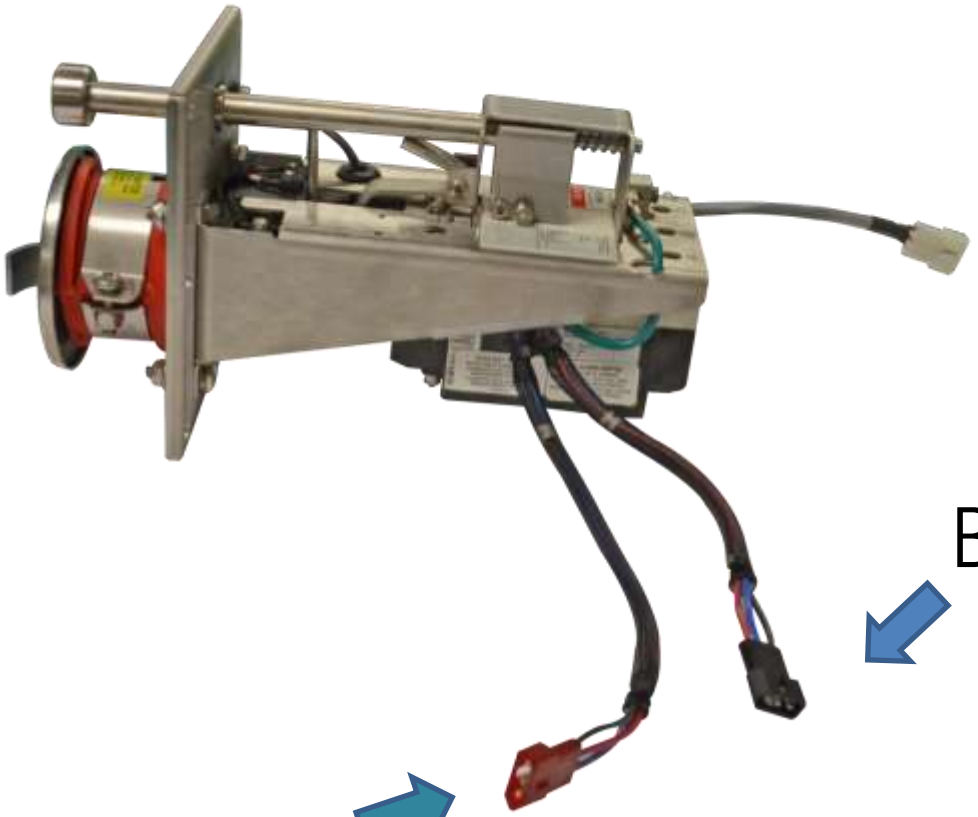
Pad Mounted

Bunker Mounted

Pole Mounted

Rack Mounted

Recent Enhancements in Reefer Outlet Technology for Automated Terminals



Plug Sensing

Bell (trip alarms)

Aux Contacts

Measuring Energy Consumption Per Reefer Outlet

Driving Factors:

- Understanding actual power consumption and power cost per reefer
- Demand based fares & peak demand
- Understanding baseline carbon footprint
- Improving terminal energy efficiency

Existing Power Metering Solutions

3-Gang with Energy Meters

6-Gang with Hour Meters

Portable Reefer Outlet Energy Meter

15-Gang with Control & Power Meter Systems

Power Metering at the Reefer Outlet

Module

Power Monitoring Module

Output

Options

Display Meter

KW •h

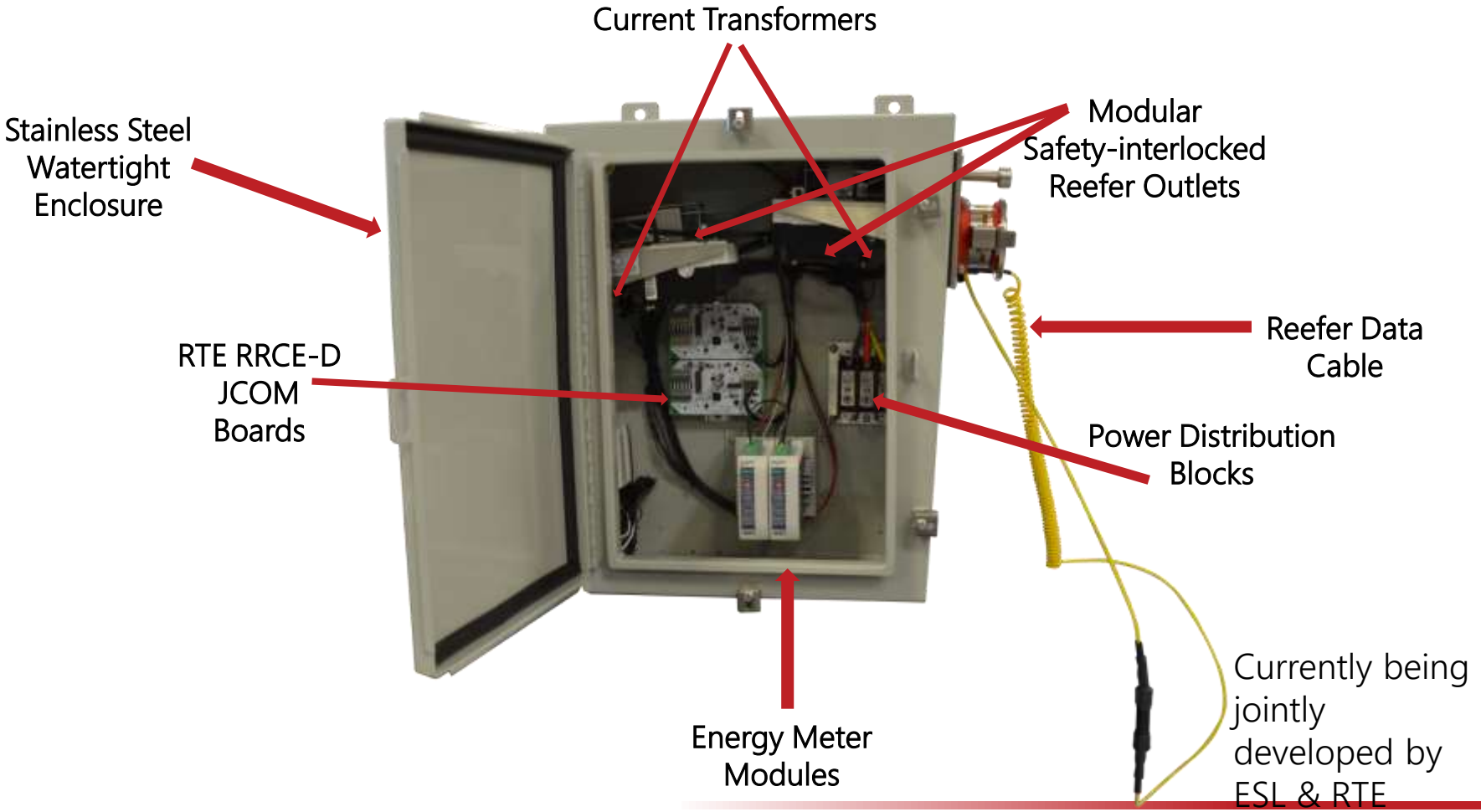
WIFI/ MODBUS

GRASP™

Integration

Next Generation Power Metering & Data Capture

- Integration of Power Metering & Reefer Monitoring



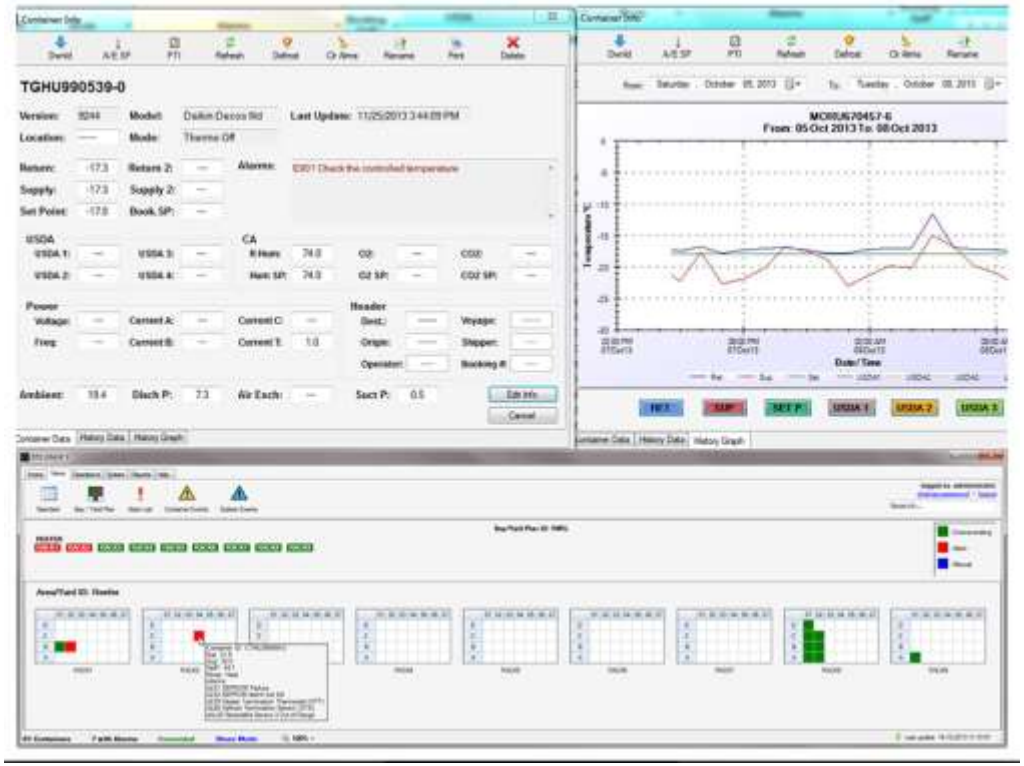
Key Benefits

- Real-time power consumption metering
  - Allows technician to verify reefer performance
  - Identify reefer equipment issues i.e. faulty plug or cable

- Samples of parameters measured
  - Power
    - Total power consumption
    - RMS current & voltage
    - Frequency
    - Power factor
  - Reefer
    - Container ID
    - Sensor Valves; temperature, air, moisture, etc.
    - Reefer operations; fan speeds, controller modes
    - Pre-trip state & alarms

RTE's – GRASP™

- Monitor reefer operating parameters & alarms
- Minimize claim risk
- Easily access container history in the event of a claim
- Increase efficiency in labor & operations
- Prepare for increased government requirements and/or EPA guidelines



Thank you!