



StationWare Case Study – City Power

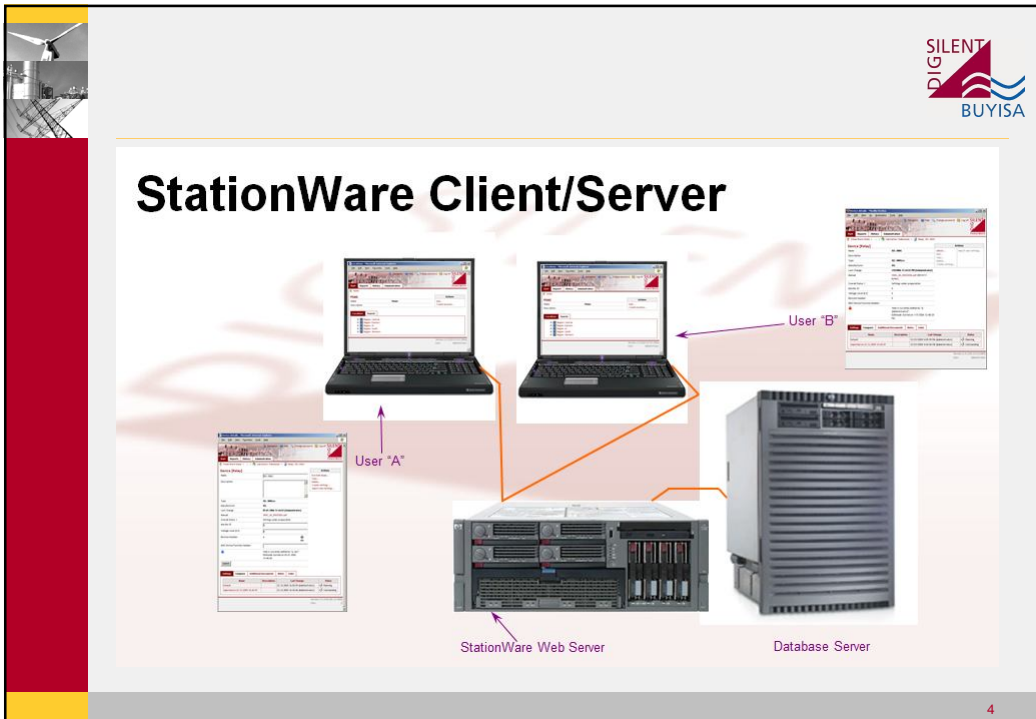
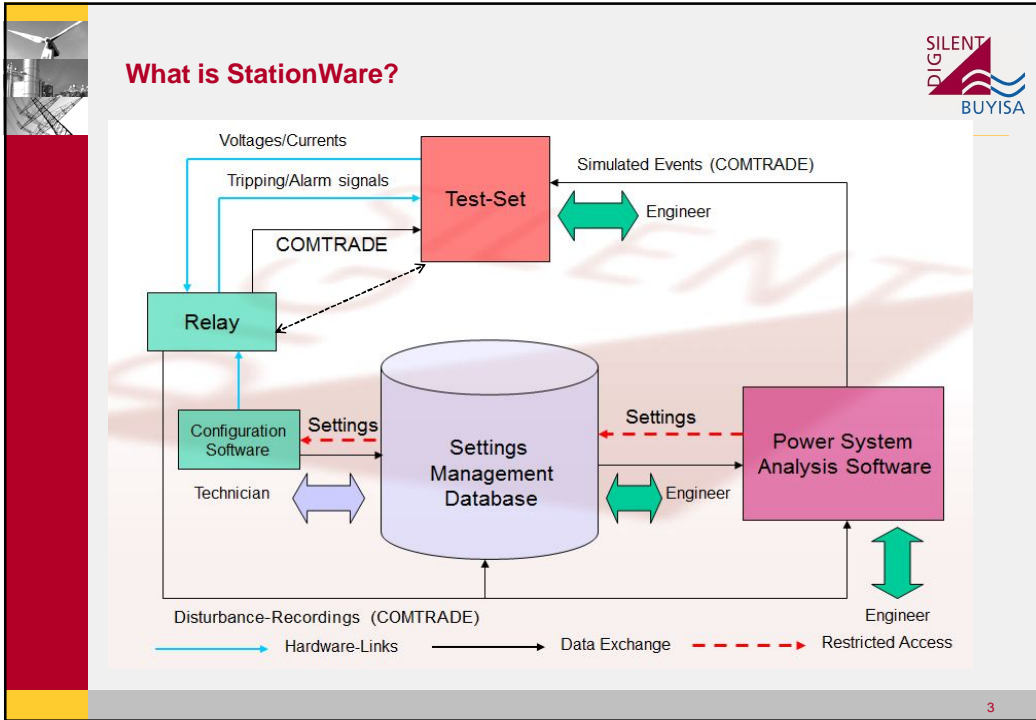
Presented by Hilton Baartman (Digsilent Buyisa)
Co-Author: Howard Nkuna (City Power)




Overview

- StationWare system setup for City Power
 - Client specific needs
 - Location Structure
 - Lifecycle
 - Users and User groups (rights management)
- Migration of existing settings to City Power's StationWare database
 - Migration process
 - Existing settings
 - Uniform formatted settings and City Power's unique 'relay' and CT
 - Converter
 - Detailed Relay configuration files

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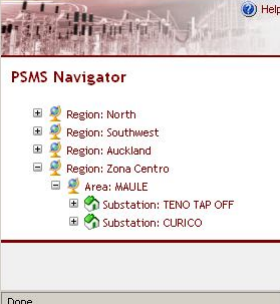
Hierarchical Location Structure

- User-defined location types
- User-defined hierarchy

Hierarchy

- [-] Region
 - [-] Area
 - [-] Sub Area
 - [-] Substation
 - [-] Feeder Bay
 - [-] Feeder Scheme
 - [-] Transformer Bay
 - [-] Transformer Scheme

http://193.97.199.148 - P5MS Tree ...




PSMS Navigator

- [-] Region: North
- [-] Region: Southwest
- [-] Region: Auckland
- [-] Region: Zona Centro
 - [-] Area: MAULE
 - [-] Substation: TENO TAP OFF
 - [-] Substation: CURICO

Done

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Locations

- 7 Areas: Edenvale, Midrand, Roodepoort, Randburg, Sandton, Johannesburg and Southern
- All substations per Area
- Bays per substation
 - FeederBay
 - IncomerBay
 - BusCoupler
 - BusSection
 - TransformerBay
 - ShuntBay
 - InterconnectorBay

– Adjusted according to voltage levels, for example 11kV_FeederBay

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Start Reports History Administration

CityPower

StationWare

Name CityPower

Description

Locations Search

- [-] Area: Edenvale
- [-] Area: Johannesburg
- [-] Area: Midrand
- [-] Area: Randburg
- [-] Area: Roodepoort
- [-] Area: Sandton
- [-] Substation: Bryanston
 - [+] 11kV_BusSection: Bus Section (NO)
 - [+] 11kV_FeederBay: Arklow
 - [+] 11kV_FeederBay: Belgrave Street
 - [+] 11kV_FeederBay: Borrowdale
 - [+] 11kV_FeederBay: Brian Street
 - [+] 11kV_FeederBay: Chesterfield Rd
 - [+] 11kV_FeederBay: Country Life
 - [+] 11kV_FeederBay: Crescent Flats
 - [+] 11kV_FeederBay: Daniel Street
 - [+] 11kV_FeederBay: Elgin Road
 - [+] 11kV_FeederBay: Grosvenor
 - [+] 11kV_FeederBay: High School
 - [+] 11kV_FeederBay: Kingswood Cres
 - [+] 11kV_FeederBay: Main Rd
 - [+] 11kV_FeederBay: Norman Ave
 - [+] 11kV_FeederBay: Panners Lane
 - [+] 11kV_FeederBay: St Andrew

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Multi-User Environment

- User accounts
- Access rights management
 - Location dependent rights
 - Lifecycle dependent rights
 - Functional rights
 - User administrator
 - Template and device manager
 - Configuration manager (lifecycle, additional attributes, customized views)

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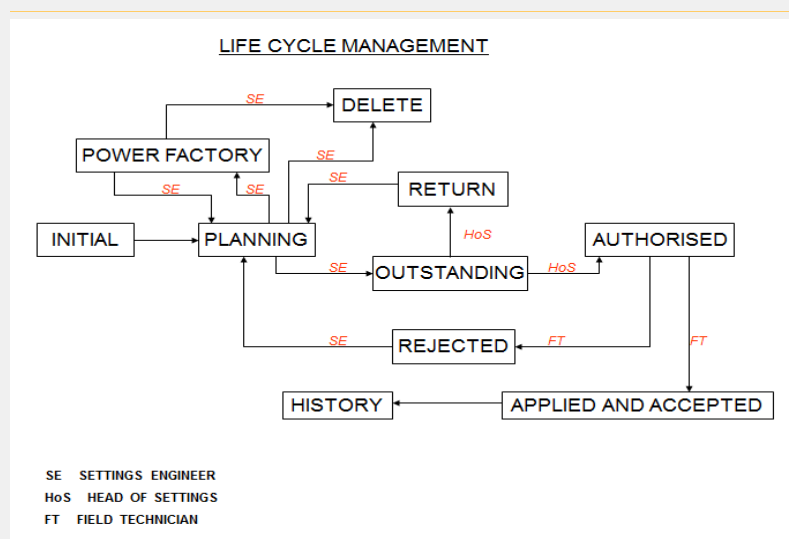
Users and User Groups

- User groups are used to assign location rights and lifecycle/settings rights to users
- 21 Users in total divided into 5 main groups
 - Administrators – Super Administrator Rights
 - Settings Engineers – Configuration rights for all locations devices and settings
 - Head of Settings – Super Administrator Rights
 - Field Technicians – Read only rights for all locations, devices. Lifecycle manager from 'Authorised' state onwards
 - Viewers only – Read only rights for all locations, devices and settings. No Administrator rights
- Each user has a username, password and valid email address

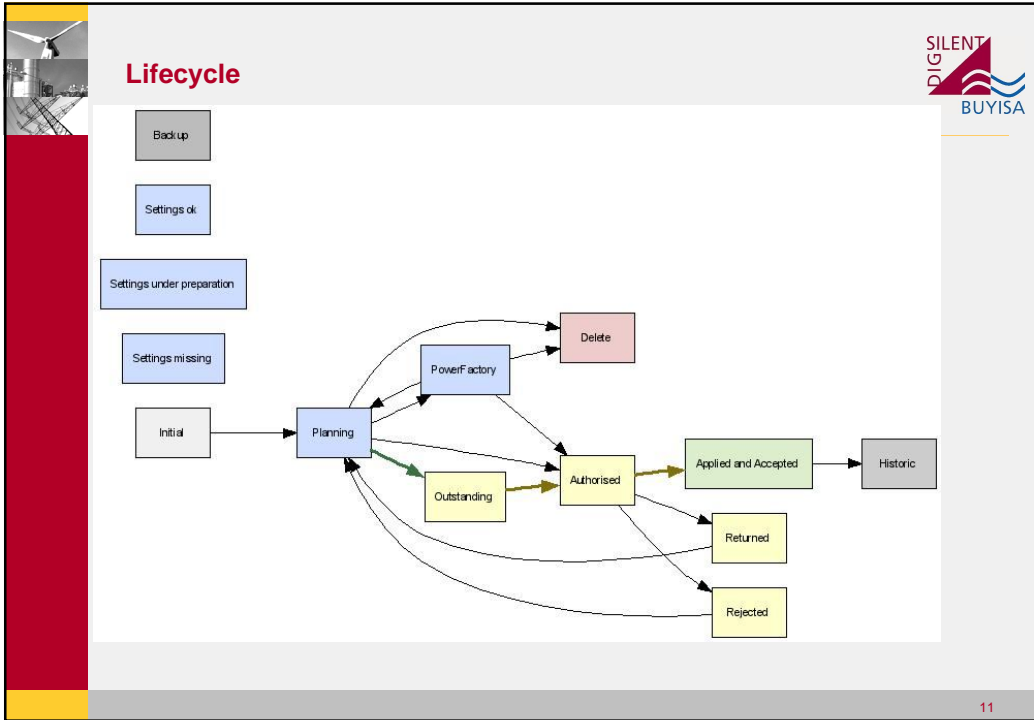
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Lifecycle



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Email Notification

- Compulsory email notification during Lifecycle changeover
- Users are responsible for selecting the users that are to be emailed
- Central system email address: stationware@citypower.co.za
- Direct Link to the settings record in email
- NB: No communication breakdown

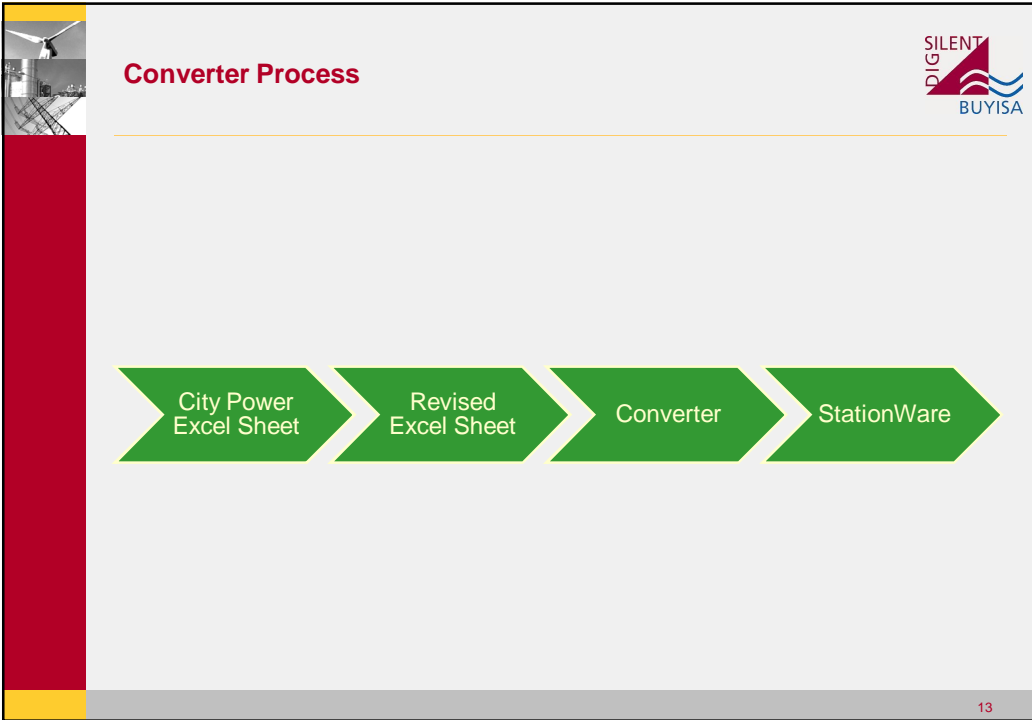
"Greetings from StationWare."

User Administrator has changed the setting status for setting: settings to Rejected.

Path: [Randburg](#) > [Beyers](#) > [Kelland 2](#) > CT
 Settings: http://172.17.0.175/psms/settings_details.aspx?sid=23833
 Device: CT
 Manufacturer: [DigSILENT](#)
 Device type: [City Power CT](#)

Do not reply to this automated message from StationWare.
 For help contact: hnkuna@citypower.co.za"

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Old Settings Sheet

Citypower settings file

| | Roodepoort area | O/C ps | O/C tm | E/F ps | E/F tm | CT ratio | CT class | CT burden | ratio used | load setting in Amps |
|---------------|---------------------------|--------|--------|--------|--------|----------|----------|-----------|------------|----------------------|
| 6.6 Kv | | | | | | | | | | |
| | William Nicol | | | | | | | | | |
| 1 | Nursery 3 | 1.25 | 1 | 40% | 1 | 200/5 | 10T | 7.5VA | 200 | 250 |
| 2 | Snowdon Avenue M/S | 1.25 | 0.1 | 40% | 0.1 | 200/5 | 10T | 7.5VA | 200 | 250 |
| 3 | Corner David & Ontdekkers | 1.25 | 0.1 | 40% | 0.1 | 200/5 | 10T | 7.5VA | 200 | 250 |
| 4 | Nursery 2 | 2 | 1 | 80% | 1 | 300/5 | 10T | 7.5VA | 300 | 600 |
| 5 | Nursery 1 | 2 | 1 | 80% | 1 | 300/5 | 10T | 7.5VA | 300 | 600 |
| 6 | William Nicol Sub | 1.25 | 0.1 | 40% | 0.1 | 200/5 | 10T | 7.5VA | 200 | 250 |
| 7 | Botha M/S 2 | 1.25 | 0.1 | 40% | 0.1 | 200/5 | 10T | 7.5VA | 200 | 250 |
| 8 | Bennevis Street M/S | 1.25 | 0.1 | 40% | 0.1 | 200/5 | 10T | 7.5VA | 200 | 250 |

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Import File


- Spread sheet per Area
- Adjusted to suit import converter

| 1 | Location Type | Location Name | Location Type | Location Name | Location Type | Location Name |
|-----|---------------|---------------|---------------|---------------|--------------------|---------------------------|
| 876 | Area | Roodepoot | Substation | William Nicol | _.6.6kV_IncomerBay | Nursery 3 |
| 877 | Area | Roodepoot | Substation | William Nicol | _.6.6kV_FeederBay | Snowdon Avenue MIS |
| 878 | Area | Roodepoot | Substation | William Nicol | _.6.6kV_FeederBay | Corner David & Onndekkers |
| 879 | Area | Roodepoot | Substation | William Nicol | _.6.6kV_IncomerBay | Nursery 2 |
| 880 | Area | Roodepoot | Substation | William Nicol | _.6.6kV_IncomerBay | Nursery 1 |
| 881 | Area | Roodepoot | Substation | William Nicol | _.6.6kV_FeederBay | William Nicol Sub |
| 882 | Area | Roodepoot | Substation | William Nicol | _.6.6kV_FeederBay | Botha MIS 2 |
| 883 | Area | Roodepoot | Substation | William Nicol | _.6.6kV_FeederBay | Bennevis Street MIS |



| G | H | I | J | K | L | M | N | O | P | Q | R |
|-------------|-------------|--------|--------|--------|--------|-----------|----------|----------|-----------|------------|----------------------|
| Device Code | Relay exist | OIC ps | OIC tm | EIF ps | EIF tm | CT exists | CT ratio | CT class | CT burden | ratio used | load setting Amps |
| | Relay | 125 | 1 | 40 | 1 | CT | 200/5 | 10T | 7.5VA | 200 | 250 |
| | Relay | 125 | 0.1 | 40 | 0.1 | CT | 200/5 | 10T | 7.5VA | 200 | 250 |
| | Relay | 125 | 0.1 | 40 | 0.1 | CT | 200/5 | 10T | 7.5VA | 200 | 250 |
| | Relay | 200 | 1 | 80 | 1 | CT | 300/5 | 10T | 7.5VA | 300 | 600 |
| | Relay | 200 | 1 | 80 | 1 | CT | 300/5 | 10T | 7.5VA | 300 | 600 |
| | Relay | 125 | 0.1 | 40 | 0.1 | CT | 200/5 | 10T | 7.5VA | 200 | 250 |
| | Relay | 125 | 0.1 | 40 | 0.1 | CT | 200/5 | 10T | 7.5VA | 200 | 250 |
| | Relay | 125 | 0.1 | 40 | 0.1 | CT | 200/5 | 10T | 7.5VA | 200 | 250 |

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Converter

City Power StationWare Data Migration

StationWare account

WebService endpoint:

Username:

Password:

City Power's protection settings

Import file:

Items to be displayed

System messages


Errors

Warnings

Created items

Updated items

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“City Power Relay”

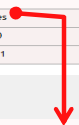
Settings

| | |
|--------------------|-------------------------------------|
| Name | settings |
| Device type | City_Power_Relay |
| Status | Authorised |
| Description | |
| Last change | 4/5/2011 7:00:54 PM [Administrator] |
| Voltage Level [kV] | 0 |
| GlobalNote | |

| Setting | Additional documents | Notes | Links | Audit trail |
|-----------------------------|----------------------|-----------------------------|-------|-------------|
| Overcurrent Settings | | | | |
| O/C ps | | Overcurrent Plug Setting | | 150 |
| O/C tm | | Overcurrent Time Multiplier | | 0.15 |
| Earth Fault Settings | | | | |
| E/F enabled | | E/F enabled | | yes |
| E/F ps | | Earth Fault Plug Setting | | 20 |
| E/F tm | | Earth Fault Time Multiplier | | 0.1 |


Earth Fault Settings

| | | |
|-------------|-----------------------------|-----|
| E/F enabled | E/F enabled | no |
| E/F ps | Earth Fault Plug Setting | yes |
| E/F tm | Earth Fault Time Multiplier | no |
| | | 50 |



| | |
|-------------|-----|
| E/F enabled | no |
| E/F ps | yes |
| E/F tm | no |
| | 50 |

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Converter

- Stand alone application (interface from Excel Sheet to StationWare)
- Creates Location Hierarchy automatically from Excel Sheet
- Creates relay and CT
- Imports settings for CT and Relay from Revised Excel Sheet
- Gives errors and warnings where data is not uniform
- Once off import

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Detailed Relay Import

- StationWare has the capability to import the relay configuration files from selected manufacturers and selected models
- In the instances where relay configuration files were available, it was imported into StationWare
- City Power had SEL AcSELeRator database files and ReyRolle Argus files from the Reydisp Evolution software
- In both cases, the files were converted to text files to import into StationWare
- Manual creation of relays and import of settings
- Actual relay configuration files stored at device level on 'Additional Documents in StationWare'



Settings

| | |
|--------------------|--------------------------------------|
| Name | Default |
| Device type | ARGUS_M_75R21_generic |
| Status | Planning |
| Description | |
| Last change | 9/7/2011 10:22:09 AM [Administrator] |
| Voltage Level [kV] | 0 |
| GlobalNote | |

| Name | File name |
|---------------------------------------|--|
| Reydisp Argus Config File_Austin View | AUSTIN VIEW PNL1 - 75R210x-1xAcx-0CA0.rsf2 (86320 bytes) |


Add document...

Audit trail


| | | | | | | |
|-----------------|---------------------|--------------------|----------------------|----------------------|---------------------|---------------------|
| CB COUNTERS | 1*2T CB WEAR | DATA STORAGE | Settings documents | Additional documents | Notes | Links |
| GENERAL ALARMS | OUTPUT CONFIG | OUTPUT MATRIX | BINARY OUTPUT CONFIG | LED CONFIG | STARTER CONFIG | CB MAINTENANCE |
| MANUAL CLOSE | CIRCUIT BREAKER | QUICK LOGIC | INPUT CONFIG | INPUT MATRIX | FUNCTION KEY MATRIX | BINARY INPUT CONFIG |
| INHUSH DETECTOR | CONTROL Bamps LOGIC | AUTORECLOSE PROT N | AUTORECLOSE CONFIG | P/F SHOTS | E/F SHOTS | SEF SHOTS |
| MPS OVERCURRENT | 4MT | 46DT | UNDER CURRENT | 37-1 | 37-2 | THERMAL SUPERVISION |
| 50N-2 | MEASURED E/F | 51G-1 | 51G-2 | 50G-1 | 50G-2 | SENSITIVE E/F |
| 51SEF-1 | 51SEF-2 | 50SEF-1 | 50SEF-2 | RESTRICTED E/F | COLD LOAD | |
| SYSTEM CONFIG | CT/VT CONFIG | FUNCTION CONFIG | CURRENT PROT N | PHASE OVERCURRENT | 51-1 | 51-2 |
| | | | | | 50-1 | 50-2 |
| | | | | | DERIVED E/F | 51N-1 |
| | | | | | | 51N-2 |
| | | | | | | 50N-1 |

| Attribute | Description | Value | Range | Unit | Assigned |
|------------------------|------------------------|------------------|-------|------|-------------------------------------|
| System Frequency | System Frequency | 50 | | | <input checked="" type="checkbox"/> |
| Setting Dependencies | Setting Dependencies | Enabled | | | <input checked="" type="checkbox"/> |
| Favourite Meters Timer | Favourite Meters Timer | 60 | | | <input checked="" type="checkbox"/> |
| Backlight timer | Backlight timer | 5 | | | <input checked="" type="checkbox"/> |
| Curr Set Display | Curr Set Display | xNom | | | <input checked="" type="checkbox"/> |
| E/F Curr Set Display | E/F Curr Set Display | xNom | | | <input checked="" type="checkbox"/> |
| Select Grp Mode | Select Grp Mode | Edge triggered | | | <input checked="" type="checkbox"/> |
| Clock Sync. From BI | Clock Sync. From BI | Minutes | | | <input checked="" type="checkbox"/> |
| Setting Password | Setting Password | NONE | | | <input checked="" type="checkbox"/> |
| Control Password | Control Password | NONE | | | <input checked="" type="checkbox"/> |
| Trip Alert | Trip Alert | Enabled | | | <input checked="" type="checkbox"/> |
| Relay Identifier | Relay Identifier | AUSTIN VIEW PNL1 | | | <input checked="" type="checkbox"/> |

Compare settings around





End Result




- Central protection settings management through lifecycle
- Audit trail available – Who changed what and when.
- Full communication with email notification
- Security of settings
- Import/Export relay configuration files
- Import/Export settings to Powerfactory
- Fault and Test reports upload available

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- Workshop on StationWare tomorrow 22 September



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