TenantEye N4 Guide

April 5, 2021
This documents the TenantEye tenant billing and sub-metering application on the Niagara N4 platform

OVERVIEW

TenantEye is a sub-metering and invoicing application. Property managers and tenants can access the entire application with a browser.   It features an extensive palette of meters, and each suite can have a unique combination of meters. PDF invoices are automatically mailed, and there is a tenant HTML interface.
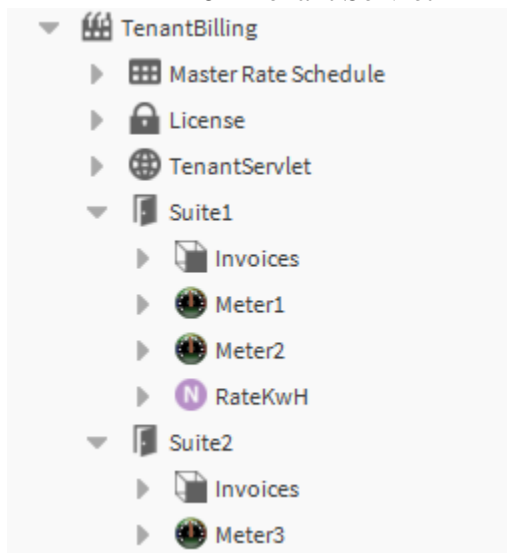
Niagara Compatibility

This software will function on all Niagara N4 4.*n.nnn* platforms.

Architecture

The root application object is the TenantBilling object. Under it belong Suite objects which represent physical space tenants occupy. Under each Suite belong meters and some of them may be linked to equipment.

- TenantBilling
  - Suites
    - Meters
  - Tenant Servlet

Workbench is needed to install these objects and perform any linking, but most other configuration can be done via the application in a web browser. Tenants can be reconfigured on a Suite by property managers without requiring a Systems integrator.

Workflow Summary

1. Module Installation
2. Adding the Driver Object
3. License Driver Object
4. Adding Network Objects
5. Configuring the Network
6. Adding Device Objects
7. Adding Points

Installation

Module Installation

1. Install kodarotenant.jar on the computer where Niagara N4 Workbench will be run. To install, place a copy of the file in the modules directory of your Niagara AX installation. This is typically C:\Niagara\Niagara-4.n.nnn\modules.
2. Restart Workbench.
3. Install the module on the target station. Using a Niagara N4 Workbench where the module has already been installed, connect to the station's platform service. Go to the Software Manager and install.

Email Service Installation

The EmailService is required for automatic invoicing.

1. If the email service is not under /services, copy and paste one from the email palette.
2. If the email service does not have an outgoing account underneath, copy and paste one from the palette.
3. The most important properties for configuration are:
   a. Hostname – either the IP address of domain name of the email server (ie mail.example.com).
   b. Port – the default SMTP port is 25.
   c. Account – An email account on the server authorized to send email.
   d. Password – The password for that account.
   e. Debug – If you are having problems, set this to true and watch the station console.
   f. Use Authentication – It is best to set this to true even though some providers do not require an account password.
4. Right-click the OutgoingAccount object, choose Actions -> Send and send a test email.

Add the TenantBilling Object

1. Open the kodarotenant palette in Workbench.
2. Copy and paste a TenantBilling object anywhere in your station.
3. Name it well, avoid name changes at all costs.
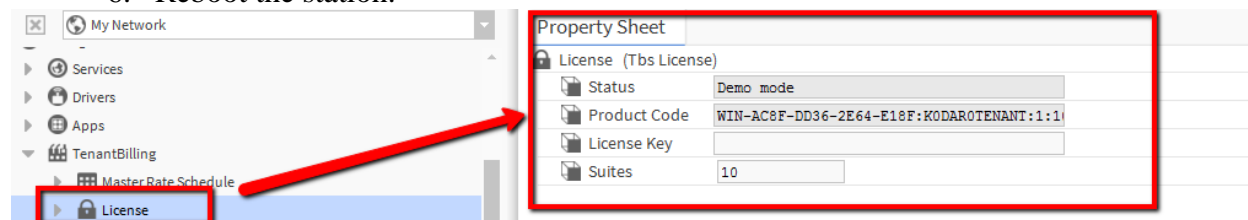4. Multiple TenantBilling objects can be installed in a station.

5. It is very important that the TenantBilling object and Suite objects not be renamed or moved after users are created. If the slotpath of these objects changes, TenantBilling users will not be able to logon to the application.
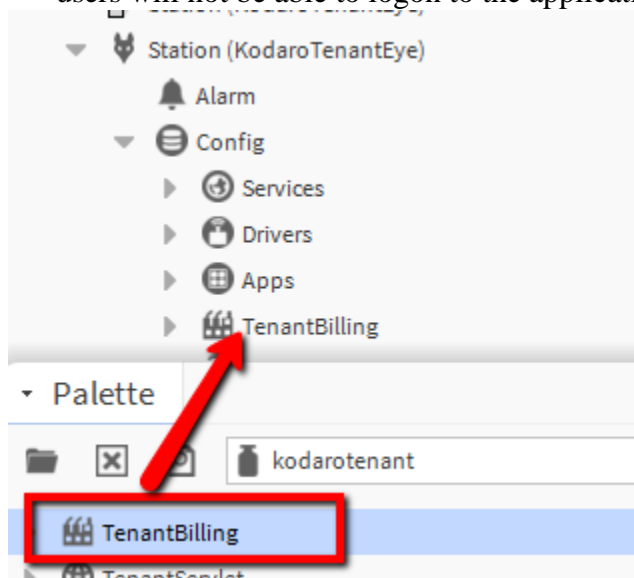
Licensing the Tenant Billing Object

Every suite must be licensed. Unlicensed suites will operate in demo mode for 2 hours. After demo mode expires, the station must be restarted to resume operation, but it is otherwise safe to build a database.

1. Go to the property sheet of the TenantBilling object. Expand or double click the "License" property.
2. Set the total number of suites that will be or have been purchased in the Suites property.
3. CTRL-C copy the "Product Code" property.
4. Paste the product code into an email and send to your distributor. The will respond with a license key.
5. CTRL-C copy the license key from your distributor. Paste it into the "License Key" property field.
6. Reboot the station.

The exact text of the product code and license key are case sensitive and critical to licensing. Please do not send screen shots. Highlight the text, copy it and paste into an email when requesting a license. Similarly, always copy and paste the license key directly into the licensing object and avoid manually typing these values.

Adding Suites

1. Name Suite objects for their physical location not the tenant. Tenant information is reconfigurable on each suite.
2. Copy and paste Suite objects from the kodarotenant palette directly under the TenantBilling object.
3. It is very important that the TenantBilling object and Suite objects not be renamed or moved after users are created or billing events logged to the database. If the slotpath of these objects changes, TenantBilling users will not be able to logon to the application.
4. Suites can be configured by going to the property manager's homepage and following the setup link for each suite.

Adding Meters

1. Choosing the right kind of meter is the hardest thing to do with this application.
2. You must first understand how the owner intends to charge the tenant before adding a meter because there are many different meters.
3. Each suite can have a unique set of meters.
4. Name your meters well, avoid renaming your meters.
5. There are many meter configurations available. For example, a meter can be tenant overrideable and have a numeric input to measure consumption. Here are some general guidelines for choosing the appropriate meter:

   Is a tenant override required?
   If yes, then you want a meter with "Scheduled" in its name. Scheduled means there is an override schedule and for a billable event to occur, an override event must be active.

   Does the meter require its own Niagara NumericSchedule rate schedule?
   If yes, then you want a meter with "Rated" in its name. Rated meters have a built in NumericSchedule which is linked to the "Rate In" property that all meters have. Other meters can set this property to a fixed hourly rate, or be linked to the master rate schedule or custom logic.

   Does the meter require a boolean input?
   If yes, choose a meter with "Boolean" in its name. Boolean meters only record billable events when the input is true and they charge for time of use.

   Does the meter require a numeric input to measure consumption?
   If yes, choose a meter with "Numeric" in its name. The application does not care what is being metered. The units (such as kWh) are configurable.

6. The meterOut property of all meters will only be true when the tenant is in a billable event. This means the criteria of the various dimensions must be true. If the meter is overrideable and has a boolean input, the input must be true and an override event must be active.

7. The meters for each suite can be configured by going to the property manager's homepage and following the setup link for each suite.

Adding the Tenant Servlet

The servlet interface is a simple HTML interface that can be used by tenants to rapidly enact overrides.

1. The servlet interface is only accessible by tenant users created in suite setup.
2. The servlet interface only works for "Scheduled" meters.
3. Paste the TenantServlet object anywhere in the station. Under the TenantBilling object would be best. If there are multiple TenantBilling objects in a single station, only one instance of the TenantServlet is needed.
4. The default URL is http://<host>/tenant. The servlet name is configurable on the property sheet of the servlet object.

User Permissions

User permissions are handled via the use of the N4 roles architecture. Users created via the user configuration pages will be created with the "Tbs User" type (Tenant Billing System). For those users created as "Property Managers/Owners", they will be given the role of "tenantEyeManager". For users created from as "Suite Users", they will be given the role of "tenantEyeSuiteUser." The first time these roles are created, they are given super user permissions.

The tenantEyeManager and tenantEyeSuiteUser cannot be removed from Tbs User type if the TenantBilling object exists in the station. If you wish to use other roles instead of the default types created by the system, this can be done as you would any regular user. To disable these roles in preference to your own, remove all permissions from them. **DO NOT** try to delete them. Removing these roles from the system or Tbs User types will not result in the expected behavior as the system routinely will check and re-add them if they are detected to be missing.

If you decide to change the default permissions, this can be accomplished if the following permissions remain in place:

1. Owner level users require admin read, write and invoke permissions for the entire TenantEye tree of objects.
2. Tenants require the operator read, write and invoke permissions for the TenantBilling object and their respective suite.

Failure to allow these permissions may result in unexpected results when using the TenantEye application.

manager (Tbs User)		suite1 (Tbs User)	
Full Name	Manager	Full Name	Tenant 1
Enabled	true	Enabled	true
Expiration	Never Expires ◇ Exp	Expiration	Never Expires ◇ Exp
Lock Out	false	Lock Out	false
Language		Language	
Email		Email	
Authenticator	Password ●●●●●●●●	Authenticator	Password ●●●●●●●●
	Confirm ●●●●●●●●		Confirm ●●●●●●●●
	Force Reset At Next Login		Force Reset At Next Login
	Never Expires ◇ Exp		Never Expires ◇ Exp
Facets	Time Format (defau	Facets	Time Format (defa
	Unit Conversion None		Unit Conversion None
Nav File	null	Nav File	null
Prototype Name		Prototype Name	
Network User	false	Network User	false
Cell Phone Number		Cell Phone Number	
Authentication Scheme Name	DigestScheme	Authentication Scheme Name	DigestScheme
Roles	✓ tenantEyeManager	Roles	✓ tenantEyeSuiteUser
	admin		admin
	tenantEyeSuiteUser		tenantEyeManager

Configuration

Configuring Owner Information

1. Double click the Tenant Billing object.
2. On the top toolbar, press the Owner Setup button.
3. Add property management and owner level users. These users can configure suites and create and modify invoices.
4. Complete the owner information. This information is used on the invoice and for emailing the invoice.
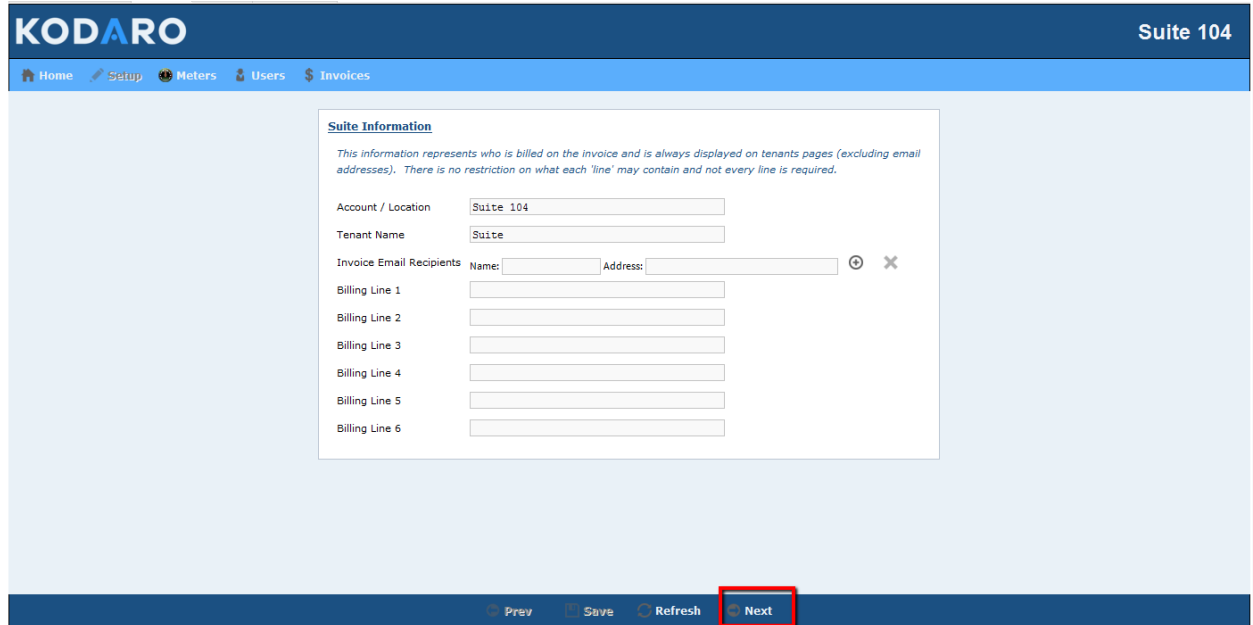5. Provide an email address for the sending of error messages.
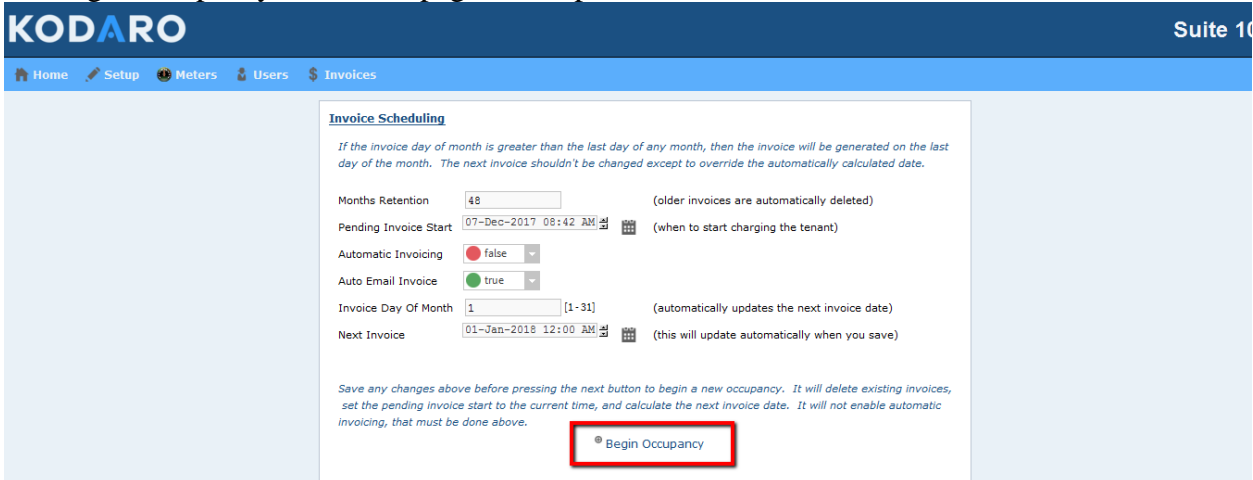
Configuring Suite Information

1. Double click the Tenant Billing object.
2. Click the setup link for each suite.
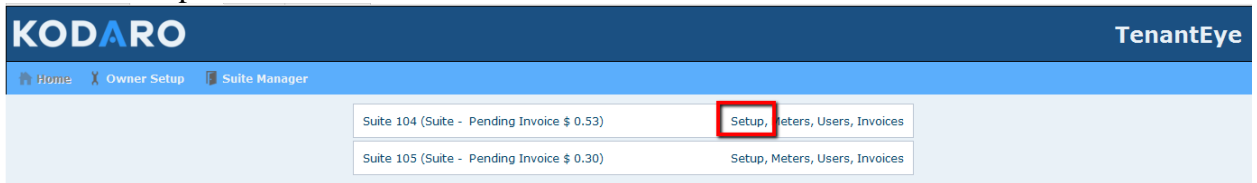
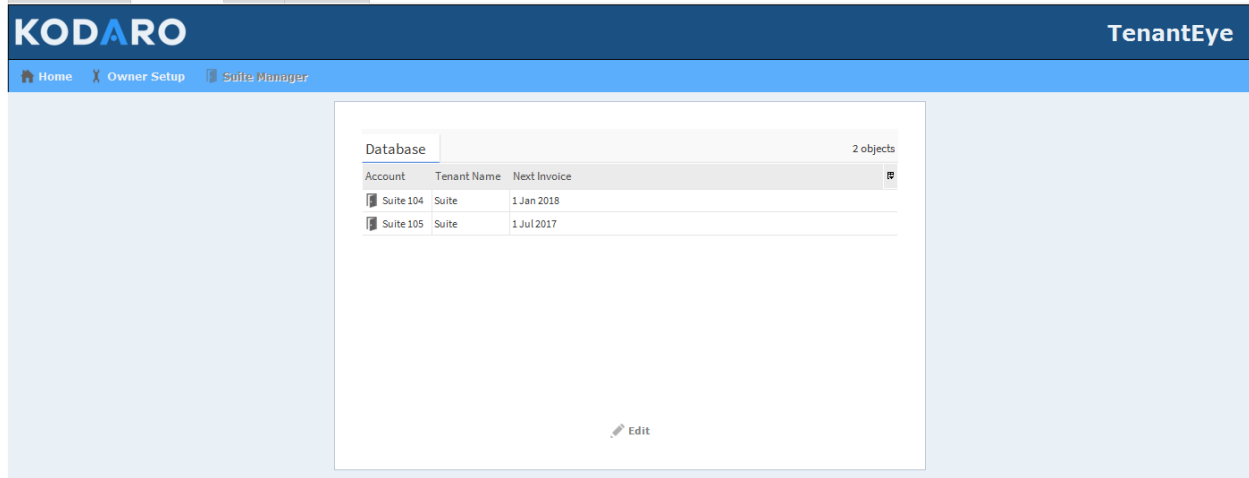3. Setup navigation is on the bottom toolbar.

4. Follow the instructions on each setup page.
5. Begin occupancy on the last page of setup.

Batch Editing Suites

1. Double click the Tenant Billing object.
2. Press the "Suite Manager" button on the top toolbar.
3. Common properties across all suites can be edited at once in the popup.

Master Rate Schedule

If every suite can share a single Niagara Numeric Schedule as the master rate schedule, there is a master rate schedule so that all suites can be configured at once.

1. Go to the property sheet of the TenantBilling object.
2. Set the "Use Master Rate Schedule" property to true.
3. The "Master Rate Schedule" is on the same property sheet.
4. Link the "Out" property of the master rate schedule to the "Rate In" property of all the target meters.
5. The master rate schedule can then be accessed and configured from the property manager's home page.
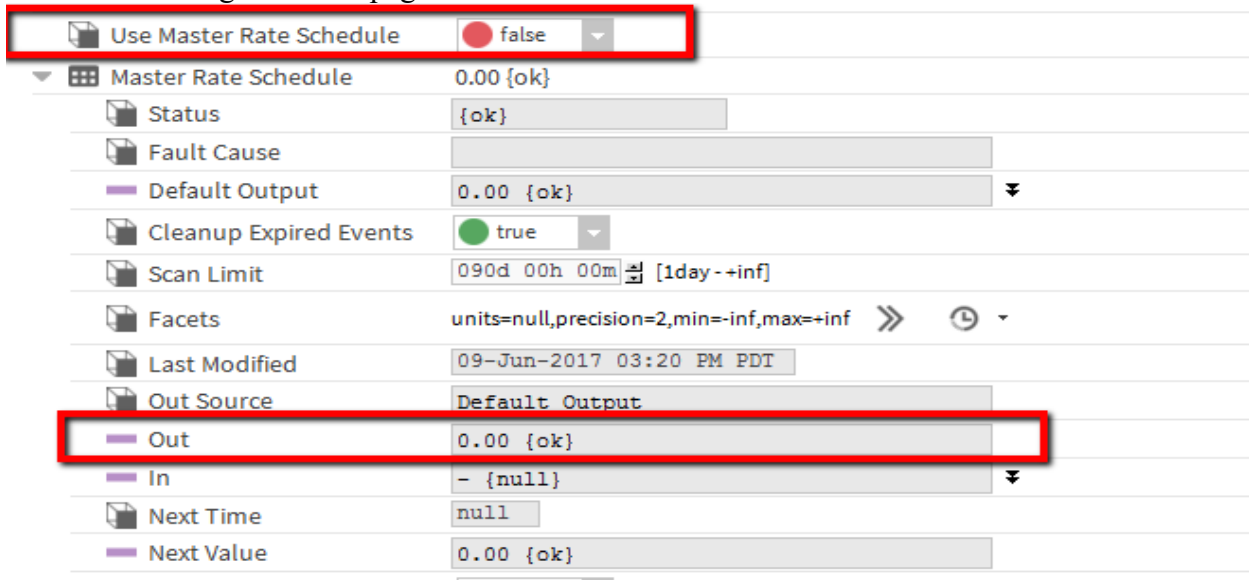
Links to External Pages

The pre-built user interface was designed as a standalone application. However, TenantEye provides a way to link out of the application from both the property manager as well as tenant pages.

1. The external link is shown as a button on the top toolbar of both the property manager and tenant homepages.
2. Configure external links on the property sheet of both the TenantBilling object and Suite objects.
3. Has External Link – Set to true.
4. External Link Image – Give the button an icon.
5. External Link Ord – Where to send the user when they click the button.
6. External Link Text – Button text.

Operation

Changing Tenants

1. From the homepage, follow the invoices link for the target Suite.
2. Setup navigation is on the bottom toolbar
3. Follow the instructions on each setup page.
4. Begin occupancy on the last page of setup. This will delete existing history and invoices for the prior tenant.

Automatic Invoicing

1. Automatic invoicing is configured in the last page of suite setup.
2. $0.00 invoices are automatically created, but will not be emailed.
3. Invoices can be modified and manually created by clicking the Invoices link for each suite.

Manual Invoicing

1. From the homepage, follow the invoices link for the target Suite.
2. Click "New" to create a new invoice. It will not be automatically emailed.
3. The invoice date will be from the time the last invoice was created until the current one. If other dates are desired, skip the rest of this second and go to "Modifying Invoices".
4. To email the invoice, select it and press the "Email" button.
5. To print the invoice, select it and press the "View" button. In the invoice view, press the "Export" button on the bottom of the screen.

Modifying Invoicing

1. From the homepage, follow the invoices link for the target Suite.
2. Double click an invoice, or select an invoice and press the "Edit" button.
3. Properties
   a. You can change the date range.
   b. There is a general adjustment field.
   c. If the invoice field you want to edit is not available such as owner or tenant information, you can always create a new invoice and change the date range.
4. After modifying an invoice, you should press the "Recalculate" button to generate a new total.
5. Press the "Email" button to send it.

Meter Guide

There are a variety of meters that measure and record billable events. Here are some guidelines for determining the best meter for any given scenario.

Rated Meters

Every meter has a numeric "Rate In" property. Meters whose type name includes the word "Rated" have a built in numeric schedule linked to that input. This schedule is accessible and editable by property managers from within the application.

All other meters leave the rate input unlinked. The application allows property managers to configure a fixed rate for these meters which is nothing more than setting the fallback value (like invoking "set" on a writable point). However, this input could be linked to something else in more advanced configurations.

Scheduled Meters

Meters whose type name includes the word "Scheduled" are tenant overrideable. This means that a user has to schedule an override for a billable event to occur. This is done through the tenant pages in the application.

Boolean Meters

These meters have a boolean "meterIn" property. The meter records the amount of time the meter is true during a billable event.

Numeric Meters

These meters have a numeric "meterIn" property. The meter records the difference between the start and end values of a billable event.

Meter Rollovers

If a Numeric meter can rollover, configure the Min Value and Max Value properties while in Workbench. These values will be used when the meter value at the end of an event is less than the starting value. If a meter can run backwards such as in solar applications, leave these properties at zero.

ScheduledMeter

This meter measures the duration of tenant scheduled overrides only.
- Meter Input – None.
- Meter Output – True if a tenant override is active.
- Rate Input – Unlinked.

RatedScheduledMeter

This meter has a built-in rate schedule and measures the duration of tenant scheduled overrides.
- Meter Input – None.
- Meter Output – True if a tenant override is active.
- Rate Input – Linked to built-in rate schedule.

BooleanMeter

This meter measures the duration that its boolean input is true.
- Meter Input – Boolean.
- Meter Output – True if there is a non-zero rate and the input is true.
- Rate Input – Unlinked.

RatedBooleanMeter

This meter has a built-in rate schedule and measures the duration that its boolean input is true.
- Meter Input – Boolean.
- Meter Output – True if there is a non-zero rate and the input is true.
- Rate Input – Linked to built-in rate schedule.

ScheduledBooleanMeter

This meter measures the duration of tenant scheduled overrides while its boolean input is true.
- Meter Input – Boolean.
- Meter Output – True if the input is true and a tenant override is active.
- Rate Input – Unlinked.

NumericMeter

This meter measures the difference of a numeric input.
- Meter Input – Numeric.
- Meter Output – True if there is a non-zero rate and a non-null numeric input.
- Rate Input – Unlinked.
- Min and Max Values – For rollovers, these properties can only be configured in Workbench. Leave at zero if the meter can run backwards.

RatedNumericMeter

This meter has a built in rate schedule and measures the difference of a numeric input.
- Meter Input – Numeric.
- Meter Output – True if there is a non-zero rate and a non-null numeric input.
- Rate Input – Linked to built-in rate schedule.
- Min and Max Values – For rollovers, these properties can only be configured in Workbench. Leave at zero if the meter can run backwards.

RatedScheduledNumericMeter

This meter has a built in rate schedule and measures the difference of a numeric input during tenant scheduled overrides.

- Meter Input – Numeric.
- Meter Output – True if there is a non-null numeric input and a tenant override is active.
- Rate Input – Linked to built-in rate schedule.
- Min and Max Values – For rollovers, these properties can only be configured in Workbench. Leave at zero if the meter can run backwards.

ScheduledNumericMeter

This meter measures the difference of a numeric input during tenant scheduled overrides.

- Meter Input – Numeric.
- Meter Output – True if there is a non-null numeric input and a tenant override is active.
- Rate Input – Unlinked.
- Min and Max Values – For rollovers, these properties can only be configured in Workbench. Leave at zero if the meter can run backwards.

HISTORY

April 5, 2021: 1.2.0

- Changed license file location for N4

August 29, 2019: 1.0.3

- Bug Fix:
  - Issue Resolved – TenantServlet not loading schedule for Date selection
  - Caused By – Niagara web server resource file loading changed

August 09, 2018: 1.0.2

- Bug Fix:
  - Issue Resolved – Meter summary details missing from the pdf export
  - Caused By - BKodaroTenantOrdScheme not resolving properly.
- Bug Fix:
  - Issue Resolved – Details summary not emailing as a pdf
  - Caused By – N4 changes to Table access during pdf generation were not compatible with methods created in AX.

December 07, 2017: 1.0.1

- Removed legacy permissions properties

October 31, 2017: 1.0

- Initial Release for N4 – Converted from AX version 3.8.3