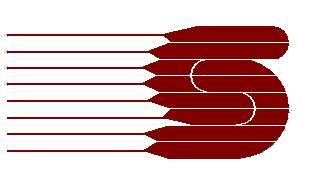
**erv-I-Quip**

**Dataserv Notification User**

**Manual**

**Serv-I-Quip, Inc.**

**127 Wallace Ave**

**Downingtown, PA**

**19335**

**Phone:(610) 873-7010**

**Fax:(610) 873-7151**

**01/30/2017**

Table of Contents

[Overview 3](#_Toc474416705)

[Requirements 3](#_Toc474416706)

[Mail 4](#_Toc474416707)

[Server Settings 4](#_Toc474416708)

[Mail Servers 4](#_Toc474416709)

[Creating/Updating Servers 4](#_Toc474416710)

[Address Groups 5](#_Toc474416711)

[Global Mail Settings 6](#_Toc474416712)

[Rules 7](#_Toc474416713)

[Basic Rule Configuration Form 7](#_Toc474416714)

[Advanced Rule Configuration Form 8](#_Toc474416715)

[Rule – General Settings 9](#_Toc474416716)

[Rule – Rule Creation & Evaluation 11](#_Toc474416717)

[Rule – Rule Mail Settings 15](#_Toc474416718)

# Overview

Dataserv Notification (ENS) is a system for generating and sending email based on live and historical information from a Dataserv enabled equipment. ENS can be configured as a standalone piece of software or incorporated into a Dataserv 3.0 system.

ENS works by looking at a series of “Data Sources”, typically the local\_DSE (live PLC data) and local\_DB (historical records stored on the local MSSQL instance). Rules can then be created that are periodically evaluated against the assigned Data Sources’ values. When the Rule evaluates to “True” then an email is generated and sent to all addresses configured in the Rule along with its assigned message.

# Requirements

For ENS to function fully the equipment running ENS needs access to a SMTP Server. By default the system has a pre-configured SMTP Server connection to a Gmail (Google/Alphabet Email) server using a Serv-I-Quip, Inc. controlled user account. To utilize this SMTP server the machine would need to have general internet access. If a direct connection to the internet cannot be established from the ENS computer than an intranet connection to an SMTP will have to be provided by the company’s Information Technology Department for ENS.

# Mail

Accessed from:

Dataserv Engine Console -> Admin -> Designers -> Extras -> Mail

Or

Dashboard -> Station -> Admin Tools -> Mail

## Server Settings

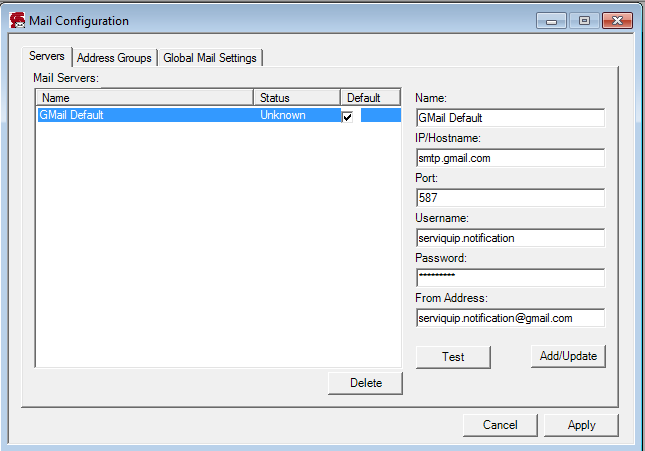


Image Mail - Server Settings

Mail Servers

Contains a list of configured servers. We only ever try to send the messages out of the one selected as “Default”. If there is an issue with the current SMTP server, selecting a different server as “Default” allows for quickly sending the currently failing messages through a different SMTP server.

### Creating/Updating Servers

Selecting a server from “Mail Server” will populate the relevant information for that configured server. If the name is changed then the information is used to create a new server. “IP/Hostname” refers to the network address of the configured mails server, if a hostname is used a DNS server will need to be configured for the computer and DNS resolution should be verified. “Port” is the destination SMTP server’s listening port, this is typically either 25 or 587.

“Username” and “Password” are the credentials used to send mail through the given SMTP server, these are not always required and will be supplied by whomever is managing the SMTP server. “From Address” is the mailbox all messages will be marked as from, we also send all messages to this mailbox for record keeping. It’s important that the “From Address” is configured correctly as some SMTP servers will drop mail that is not sent from a whitelisted address.

##### Test

The “Test” button sends a basic “hello” command to the currently supplied information. This message is sent from the computer where you have the Mail Configuration window open and not from the computer running ENS if you are editing the Mail Settings remotely. If the information resolves and the server responds how we expect an SMTP server to respond then the message “Test Successful” will appear in green under the buttons. If there is a failure there will be red text or a message box that describes the error the occurred.

## Address Groups

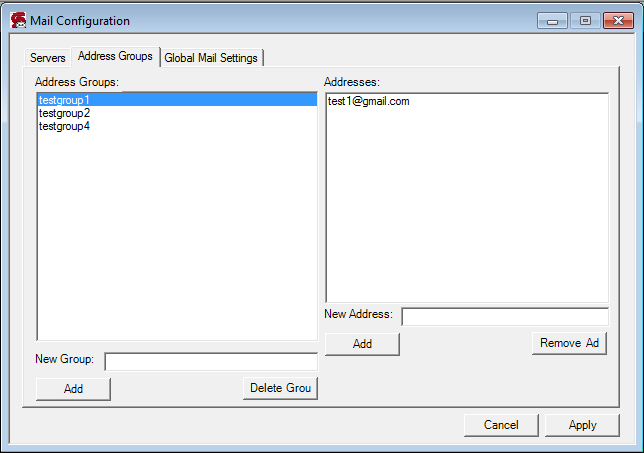


Image Mail - Address Groups

The Address Groups tab is for setting up email addresses for use in rules. Groups can be added or removed from the left list, and when a list is selected all specific email addresses associated with it will be populated into the right list. When editing a rule the list of groups will be populated into the message section, you can then choose to include any of the pre-created groups, or add a specific address at that time.

## Global Mail Settings

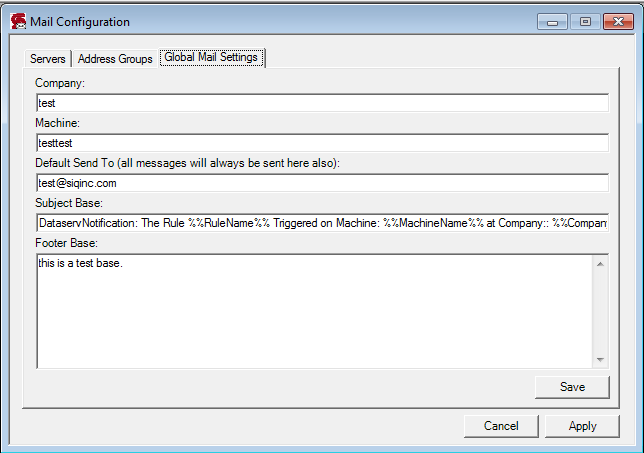


Image Mail - Global Mail Settings

The Global Mail Settings tab provides configuration for parts of the email messages that will be consistent for all messages sent from this instance of ENS. Company and Machine allow for setting a local variable that can be used to populate the given information into the message subject or body, these can be inserted by using the %%CompanyName%% or %%MachineName%% notation (Please see the [Inserts Section](#_Inserts) for more details).

The next three sectional are related to the actual mailed content. Default Send To is an address email destination for all address, we recommend having the owner of the equipement/ENS system as the default so they know when any mail is generated. Subject Base is used to setup the Subject of the emails sent out, all insert are functional here also. Footer Base is a message that will be attached to the end of all email bodies, we recommend putting a description of the machine and maybe a note on why/who to contact if you’re receiving a message from ENS.

# Rules

## Basic Rule Configuration Form

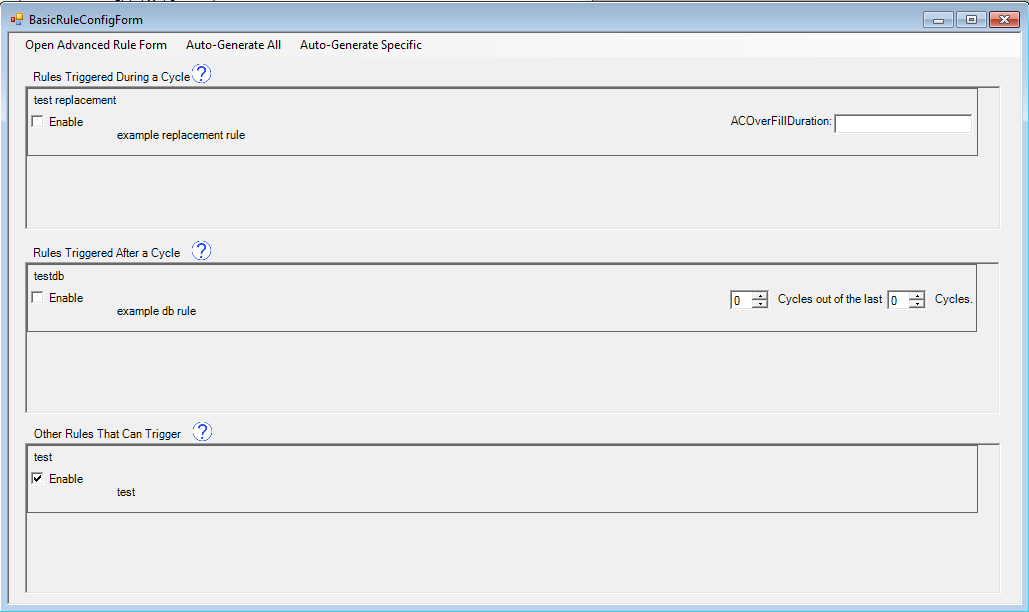


Image Basic Rule Config Form

The Basic Rule Config Form is quick way to enable or disable already existing rules, during rule creation you can select which of the three categories the rule will be classified under, and whether it has a “Cycles out of last X Cycles” option or a variable option.

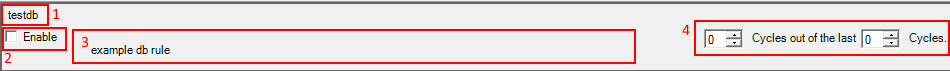


Image Basic Rule Config Form - Rule Panel

A Rule Panel on the Basic Rule Config Form contains three main pieces of information and an optional fourth. 1 is the Rule Name. 2 is the Enable Toggle, if there is a check mark than this rule is currently being evaluated. 3 is the Rule Description, this should provide some rough idea of what the rule is evaluating and why. 4 can be blank, a “Cycle out of Cycle” or “Replacement” option as configured on the actual rule. For more details please see the Rule\Options section.

## Advanced Rule Configuration Form

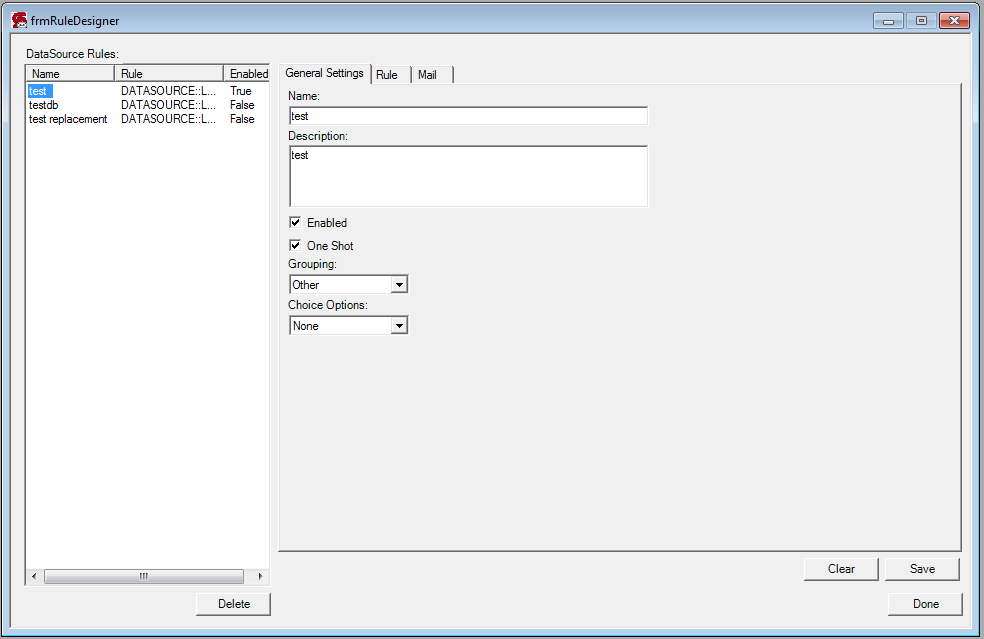


Image Advanced Rule Config Form - General Rule Settings

The Advanced Rule Configuration Form is where the primary creation and editing of Rules and Messages takes place. The left list is all of the currently configured rules on the system, selecting one populates that rule’s information into the General Settings, Rule, and Mail tabs on the right. To update a Rule you must click save after making changes under those categories, if you change the Name Field a new Rule will be created with that name and current settings without updating the Rule with the old name. The clear button will wipe the current settings out of these forms, but will not affect the currently selected rule. When the form is closed with either the done button or the close button the currently saved information will be commit the ENS system.

### Rule – General Settings



Image Advanced Rule Form - Rule General Settings

##### Name

Unique identifier for the current rule, updating this field and saving will create a new rule of that name, to rename change the name, save, and delete the old rule.

##### Description

An explanation of the intent of this rule, what it checks, and who it notifies would be useful, the text in this field will also be displayed on the basic form.

##### Enabled

This displays the Rule’s Enabled Status, which is whether it is currently being evaluated. If processing the Rule causes an error on first pass then the system will set its Enabled Status to false, but will not save that setting till the Rule is viewed in either Rule Configuration Form.

##### One Shot

The Rule “One Shot” setting means that the rule only triggers the first time it evaluates as true until it evaluates to false again, i.e. the evaluation of “One Shot” rule is “Leading Edge”.

##### Grouping

The selection of this field dictates under which display this rule will be categorized on the Basic Rule Configuration Form. The options are: “During Cycle” which would be a rule that’s processed off the current running PLC run; “Post Cycle” which would be a rule that is processed from historical records stored in a database (data from multiple runs); and “Other” one that is either a combination or doesn’t fall into the other two categories. There is no actual restriction to this field, it’s purely for visual grouping.

##### Choice Option

The selection of this field enables the optional settings on the Basic Rule Configuration Form.

###### None

There is no optional setting for this rule, i.e. this rule has nothing to manipulate on the Basic Form.

###### Number Out Of Number

This option should be used to check the rule on a frequency of historical records. This will show on the Basic Rule Configuration Form as “X out of the last Y”.



Image Display of a Number Out of Number Option

An Example of this would be if you want to know if you’re having a hose clamp issue, but only want to know if it’s a frequently occurring problem, not an occasional one off. You can create a rule to check for the pressure fill failure alarm and set it to use this option in the [Rule Logic](#_Number_Out_of) as described in the creating Rule Logic section, then you can adjust the frequency to be 1 out of 5 (every time it occurs) to 5 out of 5 (the last 5 machines all needed to fail for the same issue), or any frequency between.

###### Replacement

This option should be used if you want to be able to adjust a check without having to edit the rule directly, this can work for any type of rule, but is exclusive with “Number Out of Number”. This will show on the Basic Rule Configuration Form as “Variable Name: <Value>”.



Image Display of a Replacement Option

An example of this would be if you want to change the cut off for a notification. Say you have a rule to monitor cycle time so someone can know if a unit is taking too long to process, and if that’s the case the supervisor needs to be called over to inspect the unit/process. You can set the limit to notify as “Notify Cycle Too Long” in the [Rule Logic](#_Replacement_Option) and allow the recipient to modify the limit so they’re only called down automatically if it goes over 100, instead of 10 without modifying the Rule itself.

### Rule – Rule Creation & Evaluation

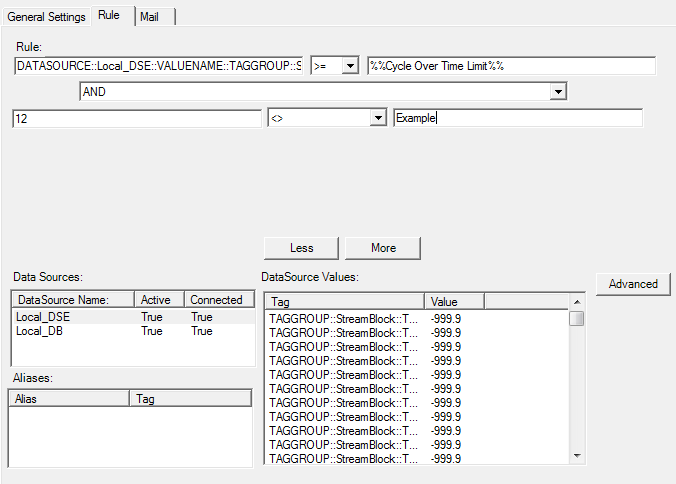


Image Advanced Rule Form - Rule Evaluation

Rule evaluation is done on Boolean logic. The evaluation logic is comprised of one or more expressions of two operands compared using an operator which are than chained using a logical operator.

##### Expression Operands

###### DataSource



Image Example Parse String

A DataSource is the ENS term for where a piece of data is coming from. There are two main types of DataSources used in ENS, a DataservEngine/PLC connection and a Database connection. The default install of ENS creates one of each, the DataservEngine/PLC connection is will called “Local\_DSE” and the Database connection is be called “Local\_DB”. By selecting one of the preconfigured DataSources under the “Data Sources:” list the “DataSource Values:” list will be populated with live readings from that DataSource. There is a right click > copy option present in the “DataSource Values:” list that will place the fully qualified parse string into the clipboard to allow easy pasting into the rule boxes for use.



Image Example Parse String - DataSource Designator Section

A specifically formatted parse string is used to retrieve values out of DataSources. The parse string consists of multiple designators and values separated by a pair of colons used as a separator marker. The first part of the parse string is the DATASOURCE designator, this indicates which source you are trying to retrieve a value from. Followed by the separator than the DataSource name.



Image Example Parse String - Value Designator Section

After the DataSource Designator Section the parse string will have a Value Designator Section, these sections are separated by the standard separator sequence ‘::’. Each type of DataSource has their own format for retrieving a specific value.

DataservEngine/PLC



Image Example Value Designator Section for DataservEngine/PLC DataSources

The generic format for a DataservEngine/PLC DataSource Value Designator Section is TAGGROUP::<group name>::TAG::<tag name>. The group and tag name come from the specific implementation of the Dataserv application running on the system. A typical system will have at least a “Preset”, “Stream”, and “Final” group. The group that is likely to be the most relevant when designing rules will be “Stream”. The “Stream” group contains all of the PLC values that are used during a cycle, e.g. running cycle times, current process levels. The “Preset” group contains all of the parameters used to test a unit, these values are taken from the recipe on the Dataserv application and sent down to the PLC at the start of a cycle. The “Final” group contains the PLC tags that are scraped at the end of a cycle which are then placed into the history records, it is better to use the Local\_DB DataSource to access these values.

Database



Image Example Value Designator Section for Database DataSources

The generic format for a Database DataSource Value Designator Section is TABLE::<table name>::ROW::<selected row>::FIELD::<column name>. A Database DataSource is configured as a straight connection to a Database, any table in the DataSource’s connection will be pulled in and is accessible once connected.

There are a few options for the ‘Selected Row’, the raw row index (as sorted by ID/chronological insert), which will always return the same row. There is a “LAST<x>” call, this uses the inverted ID/chronological ORDER BY, as such ‘LAST1’ would evaluate against the

most recent record. There exists a range notation for both the ‘LAST’ and regular, this is utilized by passing selected row as “LAST<x>-<y>” or just “<x>-<y>” and returns the average for that row range.

Number Out of Number Parse Requirement

If the rule is using the “Number Out of Number” option than the <selected row> should always be “%%ReplaceRow%%” to enable that functionality on the check.

###### Alias

Aliases are pre-configured shorthand. These are setup through the Alias Configuration Form and will show up in the Alias list view on the Rule Configuration Tab. Aliases use a basic replacement methodology, if one of the expression operands is in the Alias list then the evaluation method processes the operand that Alias refers to.

###### Replacement Option

If the currently processed rule is set as a “Replacement” choice option than the system is expects a use of the Replacement Notation. That notation is “%%<replacement variable name>%%”, the variable name will be the field name as displayed on the Basic Rule Form Panel. Then the value entered on the Basic Form Panel is used in place of the variable during evaluation as a LITERAL.



Image Rule Expression Setup Using Replacement



Image Rule's Display on Basic Form

###### LITERAL

If an expression operand is in the form “LITERAL::<text>” then the “<text>” will be what the expression is evaluated on. If an operand does not match any other type, even without the “LITERAL::” it will be treated like a LITERAL. As an example “1 = 1” is a valid expression and will return a logical True.

##### Expression Operators

###### =

This is the “Equal” operator and will compare if the value of the two operands have equivalent value, e.g. a tag with current value 1 is equal to the LITERAL::1.

###### <>

This is the “Not Equal” operator, when evaluated this operator checks if the two operand values are not the same, e.g. a tag with current value 1 is not equal to LITERAL::2.

###### <

This is the “Less Than” operator, when evaluated this operator checks if the first operand has a lower value than the second, e.g. a tag with current value 1 is less than LITERAL::2. This operator should only be used when evaluating numeric values.

>

This is the “Greater Than” operator, when evaluated this operator checks if the first operand has a higher value than the second, e.g. a tag with current value 1 is greater than LITERAL::0. This operator should only be used when evaluating numeric values.

<=

This is the “Less Than or Equal” operator, when evaluated this operator checks if the first operand has a lower value than the second if they are the same than it still evaluates to true, e.g. a tag with current value 1 is less than or equal to LITERAL::2. This operator should only be used when evaluating numeric values.

>=

This is the “Greater Than or Equal” operator, when evaluated this operator checks if the first operand has a greater value than the second if they are the same than it still evaluates to true, e.g. a tag with current value 1 is greater than or equal to LITERAL::0. This operator should only be used when evaluating numeric values.

##### Linking Multiple Expressions

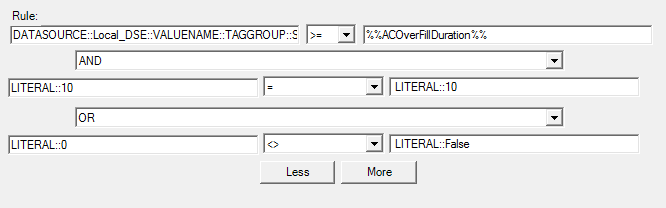


Image Rule with Multiple Expressions

Expressions are evaluated for logical equivalency, each expression will either be a True or False statement at the time of evaluation. Pressing the ‘More’ button will allow chaining together of multiple expressions on the Advanced Rule Form. The ‘Less’ button will remove the lowest expression from the evaluation logic. Chained expressions are grouped from the bottom up, so when a new expression is added, the Logic Operator acts on the newest and the one above it, than the result of that evaluation is used with the next highest Logical Operator.

###### Logical Operators

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Expression 1 Evaluation | Expression 2 Evaluation | AND | OR | XOR |
| TRUE | TRUE | TRUE | TRUE | FALSE |
| TRUE | FALSE | FALSE | TRUE | TRUE |
| FALSE | TRUE | FALSE | TRUE | TRUE |
| FALSE | FALSE | FALSE | FALSE | FALSE |

Image Support Logical Operators Truth Table

AND

The ‘AND’ logical operator dictates that both of the expressions being evaluated must be TRUE for the Chained Expression to be TRUE.

OR

The ‘OR’ logical operator dictates that if either both or one of the expressions are TRUE than the Chained Expression is TRUE.

XOR

The ‘XOR’ (Exclusive OR) logical operator dictates that if and only if one and not both expressions evaluate as TRUE is the Chained Expression TRUE.

### Rule – Rule Mail Settings

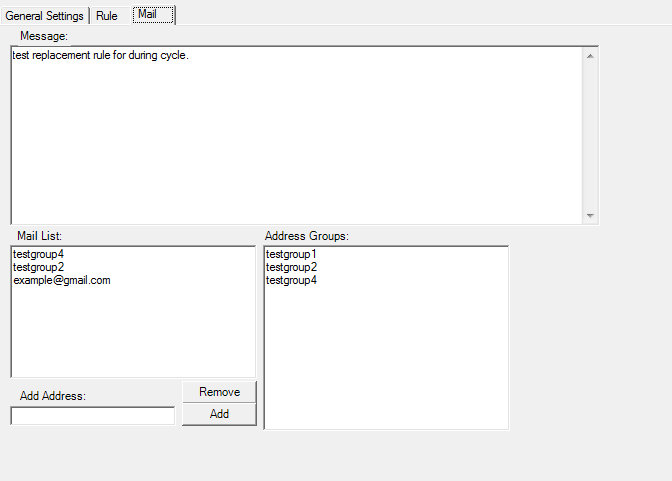


Image Advanced Rule Form – Rule Mail Settings

The Mail tab is used to setup the specific message and recipients that will be notified when the current Rule is triggered. The message should be a description of the problem and course of action for the given Rule. The Mail List is the currently selected set of recipients that will receive the message, the “From Address” and “Always Send to Address” as configured in the mail settings will be included automatically behind the scenes. Double clicking on an address group will add them to the current recipient list, to configure additional groups please see the [Mail Settings – Address Groups](#_Address_Groups) section.

##### Inserts

The message body along with the subject and footer (see [Mail Settings – Global Mail Settings](#_Global_Mail_Settings)) support special insert clauses. These are parse-able strings that allow the message to contain specific current information, or make it easier to move rules between ENS installations.

###### Expression Operand Insert

Any of the Operands detailed in the [Rule – Rule Creation & Evaluation – Expression Operands](#_Expression_Operands) can be included in the message as long as they are enclosed in two sets of ‘%%’. E.g. if the message contains “%%DATASOURCE::Local\_DSE::VALUENAME::TAGGROUP::StreamBlock::TAG::DEFTotalDispensed%%” when the message is received that entire string will be replaced with the actual value of “DEFTotalDispensed” that the PLC is currently holding. This is particularly useful so the message can have the actual triggering values to let the receivers know the explicit event they are being notified of.

###### Global Mail Setting Info

The currently set Company Name and Machine Name can be included in the message by setting using %%CompanyName%% or %%MachineName%% respectively. When generated they pull the current setting from [Mail Settings – Global Mail Settings](#_Global_Mail_Settings). When moving rules between ENS installations the message can have the correct name of the generating machine, or can be shared within an organization and identify owner ship or location of the machine.

###### Rule Name

The parse string “%%RuleName%%” can be used to place the Rule’s name in the generated message.

###### Time

The parse string “%%TIME%%” can be used to place a time stamp of generation in the message.

##### Example Message

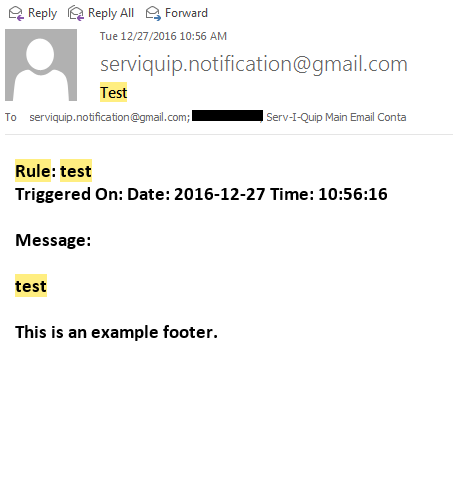


Image Example Message as Generated by ENS

When a message is generated and sent through the ENS system, all recipients are CC’d together allowing a quick communication thread to be started. The subject of the message is setup as dictated on the [Mail Settings – Global Mail Settings](#_Global_Mail_Settings). The message body will always start with “Rule:<rule name>” than the generating date. The message configured in the [Rule – Rule Mail Settings](#_Rule_–_Rule) will then be parsed for inserts and appended after “Message:” with the footer configured in the [Mail Settings – Global Mail Settings](#_Global_Mail_Settings) appended to it.