CEyesGP1 – General Purpose Module Engineering Guide

Overview

- The CEyesGP1 module is a general purpose analysis and diagnostics component used used for custom applications.
  - Typical applications:
    - Central plant equipment applications.
    - Misc. equipment applications.
    - Can be linked to any of the other CEyes modules to expand their capabilities.

Licensing

- Continual-Eyes™ may be licensed on any NiagaraAX® station.
- The base license includes a capacity of 15 points (or modules)
- Additional points (or modules) may be licensed.

Module Execution Properties

- Module execution rate and duration.
  - Continuous execution:
    - The default settings will enable the CEyesGP1 module to execute at all times after initial execution period. (The beginning of the first hour after the placement of the module or after station restart).
  - Execution properties:
    - [ExecutionPeriod] specifies the amount of time that will pass between successive starts of the execution of the logic within this object. If [ExecutionPeriod] is set to 600 seconds (5 minutes), then the logic will be started at 0 minutes past each hour, 5 minutes past and so on until 55 minutes past. If [ExecutionPeriod] is set to 7200 seconds (2 hours), then the logic will be started at midnight, 2AM, 4AM and so on until 10PM.
    - [ExecutionOffset] allows for the modification of the timing of the execution. It specifies the amount of time into the execution period to wait until executing the logic. If [ExecutionPeriod] is set to 600 seconds (5 minutes) and [ExecutionOffset] is set to 60 seconds (1 minute), then the logic will be started at 1 minute past each hour, 6 minutes past, and so on until 56 minutes past. This allows the “staggering” of object execution.
    - [ExecutionDuration] specifies how long a period of time within each execution period the logic will run. If [ExecutionPeriod] and [ExecutionOffset] are set to 5 minutes and 1 minute, respectively and [ExecutionDuration] is set to 2 minutes, then the logic will run continuously from 1 minute past the hour until 3 minutes past the hour, from 6 minutes past until 8 minutes past, etc.
    - [IterationPeriod] is the rate at which the logic inside the object will execute.
    - [Executing] is a read property to view the current status of the module execution.

- **Alarms**
  - ***[PIDLoop1Alarm]***
    - Description
      - Indication of an unacceptable modulation or cycling of the control loop.
    - Inputs and Parameters
      - Required connections
        - [PIDLoopSig1]
      - Parameters
        - [PIDLoop1AlarmSetpoint]
        - [PIDLoop1AlarmDelay] in seconds.
        - [PIDLoop1SampleRate] in seconds. This is the rate at which the input is read. Use higher values on slower control loops.
        - [PIDLoop1FilterUpdateTime] in seconds. This is the rate at which the [PIDLoop1Error] is updated. Use higher values on slower control loops.
        - [PIDLoop1FilterStepSize] This is the maximum amount of change in the [PIDLoop1Error] at each [PIDLoop1FilterUpdateTime].
      - Calculated values or other parameters
        - [PIDLoop1Error] (Read Only)

  - ***[PIDLoop2Alarm]***
    - Description
      - Indication of an unacceptable modulation or cycling of the control loop.
    - Inputs and Parameters
      - Required connections
        - [PIDLoopSig2]
      - Parameters
        - [PIDLoop2AlarmSetpoint]
        - [PIDLoop2AlarmDelay] in seconds.
        - [PIDLoop2SampleRate] in seconds. This is the rate at which the input is read. Use higher values on slower control loops.
        - [PIDLoop2FilterUpdateTime] in seconds. This is the rate at which the [PIDLoop2Error] is updated. Use higher values on slower control loops.
        - [PIDLoop2FilterStepSize] This is the maximum amount of change in the [PIDLoop2Error] at each [PIDLoop2FilterUpdateTime].
      - Calculated values or other parameters
        - [PIDLoop2Error] (Read Only)

  - ***[CtrlVarOverStptAlarm_1]***
    - Description
      - Indication that the control variable is higher than the control variable setpoint.
    - Inputs and Parameters

- Required connections
  - [CtrlVar_1]
  - [CtrlSetpoint_1]
- Parameters
  - [CtrlVarOverStptMult_1]
  - [CtrlVarStptAlarmsEnable_1]
  - [CtrlVarStptAlarmDelay_1] in seconds.

- ***[CtrlVarUnderStptAlarm_1]***
  - Description
    - Indication that the control variable is lower than the control variable setpoint.
  - Inputs and Parameters
    - Required connections
      - [CtrlVar_1]
      - [CtrlSetpoint_1]
    - Parameters
      - [CtrlVarUnderStptMult_1]
      - [CtrlVarStptAlarmsEnable_1]
      - [CtrlVarStptAlarmDelay_1] in seconds.

- ***[CtrlVarOverStptAlarm_2]***
  - Description
    - Indication that the control variable is higher than the control variable setpoint.
  - Inputs and Parameters
    - Required connections
      - [CtrlVar_2]
      - [CtrlSetpoint_2]
    - Parameters
      - [CtrlVarOverStptMult_2]
      - [CtrlVarStptAlarmsEnable_2]
      - [CtrlVarStptAlarmDelay_2] in seconds.

- ***[CtrlVarUnderStptAlarm_2]***
  - Description
    - Indication that the control variable is lower than the control variable setpoint.
  - Inputs and Parameters
    - Required connections
      - [CtrlVar_2]
      - [CtrlSetpoint_2]
    - Parameters
      - [CtrlVarUnderStptMult_2]
      - [CtrlVarStptAlarmsEnable_2]

- [CtrlVarStptAlarmDelay_2] in seconds.

- ***[DeltaMaxAlarm_1]***
  - Description
    - Indication that the maximum inlet and outlet differential across a controlled component has been exceeded. (Ex: Heat exchanger temperature, or pressure).
  - Inputs and Parameters
    - Required connections
      - [DeltaInletVar_1]
      - [DeltaOutletVar_1]
    - Parameters
      - [DeltaAction_1] true = Direct Acting / false = Reverse Acting
      - [DeltaAlarmsEnable_1]
      - [DeltaAlarmDelay_1] in seconds.
      - [DeltaMax_1]

- ***[DeltaMinAlarm_1]***
  - Description
    - Indication that the minimum inlet and outlet differential across a controlled component has been exceeded. (Ex: Heat exchanger temperature, or pressure).
  - Inputs and Parameters
    - Required connections
      - [DeltaInletVar_1]
      - [DeltaOutletVar_1]
    - Parameters
      - [DeltaAction_1] true = Direct Acting / false = Reverse Acting
      - [DeltaAlarmsEnable_1]
      - [DeltaAlarmDelay_1] in seconds.
      - [DeltaMin_1]

- ***[DeltaMaxAlarm_2]***
  - Description
    - Indication that the maximum inlet and outlet differential across a controlled component has been exceeded. (Ex: Heat exchanger temperature, or pressure).
  - Inputs and Parameters
    - Required connections
      - [DeltaInletVar_2]
      - [DeltaOutletVar_2]
    - Parameters
      - [DeltaAction_2] true = Direct Acting / false = Reverse Acting
      - [DeltaAlarmsEnable_2]
      - [DeltaAlarmDelay_2] in seconds.

        - [DeltaMax_2]

- ***[DeltaMinAlarm_2]***
    - Description
        - Indication that the minimum inlet and outlet differential across a controlled component has been exceeded. (Ex: Heat exchanger temperature, or pressure).
    - Inputs and Parameters
        - Required connections
            - [DeltaInletVar_2]
            - [DeltaOutletVar_2]
        - Parameters
            - [DeltaAction_2] true = Direct Acting / false = Reverse Acting
            - [DeltaAlarmsEnable_2]
            - [DeltaAlarmDelay_2] in seconds.
            - [DeltaMin_2]

- ***[ExcessiveRunTimeAlarm]***
    - Description
        - Indication of a component exceeding an expected continuous run time. (Typical use would be to indicate an extended component override).
    - Inputs and Parameters
        - Required connections
            - [ExcessRunInput]
        - Parameters
            - [ExcessRunMaxRunTime] in hours.

- ***[ResetAlarm]***
    - Description
        - Indication that a reset setpoint is not resetting as expected signaling a possible override condition. This algorithm is expecting to see a change in the reset setpoint when the reset sensor is between the values of the reset high and low values.
    - Inputs and Parameters
        - Required connections
            - [ResetSensor] (Sensor that is resetting the setpoint).
            - [ResetSetpoint]
        - Parameters
            - [ResetAlarmEnable]
            - [ResetAlarmDelay] in hours.
            - [ResetLowValue]
            - [ResetHighValue]

- ***[AnyAlarm]***
    - Description

- Indication of any alarm active with this module. Primarily used for system alarm indication or to share into an associated module's [AssocAlarm] input.

- Optional Input
  - [AssocAlarm] is used to indicate alarm condition of associated modules.
- Operation
  - [AnyAlarm] will be initiated:
    - When any of the alarms above are initiated
    - OR
    - [AssocAlarm] = true