Attack Behaviors

Attack scenarios are classified into the two categories depending on the attack points.

I/O point: This type of attack indirectly manipulates SP, PV, and CO points, which are PCL parameters, through I/O point manipulation. This type of attack scenarios has been used to generate test data for all versions of HAI datasets.

Internal point: This type of attack manipulates the parameter value of algorithm function that determines the internal points. Depending on function, this attack is activated when a specific condition is satisfied. This type of attack scenarios was only used in HAI/HAIEnd 23.05.

ATTACK SCENARIOS TARGETING I/O POINTS

Since 2019, attack scenarios targeting I/O points have been continuously developed, and the attack scenarios have been implemented by considering attack target, attack time, and method for each feedback control loop.

Target

HAI

Scenario

Description

Controller

Variable

Point

20.07

21.03

22.04

23.05

Decrease or increase SP value of P1-PC.

AP01

P1-PC

SP1

P1_B2016

Restore as a form of a trapezoidal profile while

hiding SP changes in HMI.

Decrease or increase SP value of P1-PC.

SP1

P1_B2016

Restore as a form of a trapezoidal profile while

AP02

P1-PC

hiding SP changes in HMI.

PV1

P1_PIT01

Attempt to maintain previous sensor value.

Decrease or increase SP value of P1-PC.

SP1

P1_B2016

Restore as a form of a trapezoidal profile while

hiding SP changes in HMI.

AP03

P1-PC

PV1

P1_PIT01

Attempt to maintain previous sensor value.

PV2

P1_FIT01

Attempt to maintain previous sensor value

AP04

P1-PC

CV1

Decrease or increase CV value of P1-PC.

P1_PCV01D

Restore to normal.

Decrease or increase CV value of P1-PC.

CV1

P1_PCV01D

Restore to normal.

AP05

P1-PC

PV1

P1_PIT01

Attempt to maintain previous sensor value.

Short-term (ST) attack that decrease or

AP06

P1-PC

SP1-ST

increase SP value of P1-PC for a few seconds

P1_B2016

and restores to normal. Repeat several times

while hiding SP changes in HMI.

Short-term (ST) attack that decrease or

P1-PC

increase CV value of P1-PC for a few seconds

AP07

CV1-ST

P1_PCV01D

and restores to normal. Repeat several times

while hiding SP changes in HMI.

Decrease or increase SP value of P1-FC.

AP08

P1-FC

SP1

P1_B3005

Restore as a form of a trapezoidal profile while

hiding SP changes in HMI

Decrease or increase SP value of P1-FC.

SP1

P1_B3005

Restore as a form of a trapezoidal profile while

AP09

P1-FC

hiding SP changes in HMI

PV1

P1_FT03

Attempt to maintain previous sensor value.