

如何防止 Aspen DMC3 控制器（RTE）因间歇性读取失败而关闭

编者按

1) 这篇[中文技术支持文章](#)将会告诉我们如何如何防止 Aspen DMC3 控制器（RTE）因间歇性读取失败而关闭。

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5) 言归正传，请您欣赏我们的中文技术支持文章：

如何防止 Aspen DMC3 控制器（RTE）因间歇性读取失败而关闭

问题描述

由于网络突发故障或外部因素，如果 Cim-IO 无法从 OPC 服务器读取数据，那么使用 RTE 部署的 Aspen DMC3 控制器中的所有变量将标记为坏状态，从而导致导致控制器关闭。如果发生这种情况，WebViewer 上的消息将如下图显示一个周期内所有变量为无效值：

APC: HGP1DMC3ST (APCTRNG) x +

localhost/atcontrol/operations.asp?appid=APCTRNG%5E6%5EHGP1DMC3ST%5Eall%20variables

Name	Description	Critical	Combined Status	Service Request	Operator Low Limit	Measurement	Steady State Value	Operator High Limit	Ramp Setpoint	
08FC413.SP	DC3 Liquid Propane	No	Bad Value	On	On	3020.854	3000.000	-9999.000	15000.000	0.000
08TC421.SP	DC3 Bottoms Temp	No	Bad Value	On	On	269.534	255.000	-9999.000	270.000	0.000
08PC404.SP	DC3 Overhead Pressure	No	Bad Value	On	On	270.757	255.000	-9999.000	275.000	0.000
08PC504.SP	TANK1 Pressure	No	Bad Value	On	On	264.026	242.000	-9999.000	265.000	0.000
08TI901.PV	Ambient Temperature	No	Normal	On		89.000		89.000		

Dependents Filter: None

Name	Description	Critical	Combined Status	Service Request	Operator Low Limit	Measurement	Steady State Value	Operator High Limit	Ramp Setpoint
08FC101.OP	DC2 Feed Valve	No	Bad Value	On	35.000	66.555	66.647	84.000	
08PC104.OP	DC2 Ovhd Press Valve	No	Bad Value	On	41.000	79.005	79.090	80.000	
08FC220.OP	FURN1 Fuel gas valve	No	Bad Value	On	10.000	13.853	15.135	70.000	
08FC412.OP	DC3 Reflux valve	No	Bad Value	On	30.000	59.185	59.204	75.000	
08FC413.OP	DC3 Liq propane valve	No	Out Eng	On	20.000	30.320	0.557	50.000	
08FC422.OP	DC3 Steam valve	No	Bad Value	On	37.000	42.131	42.145	65.000	
08PD406.PV	DC3 Cond DP	No	Bad Value	On	5.000	6.255	6.200	12.600	
08PD409.PV	DC3 DP	No	Bad Value	On	1.600	1.913	1.916	2.200	
08TI403.PV	DC3 Ovhd Temp	No	Bad Value	On	124.000	128.417	128.759	130.000	
08LC411.PV	DC3 Ovhd Level	Yes	Bad Critical	On	30.000	64.832	123.822	70.000	50.000
08PC404.OP	DC3 Ovhd Press Valve	No	Bad Value	On	30.000	62.082	62.702	70.000	
08PC504.OP	TANK1 Press Valve	No	Bad Value	On	20.000	41.812	41.593	78.000	
08AI414.PV	DC3 Ovhd C2	No	Bad Value	On	0.400	0.691	0.712	1.500	
08AI415.PV	DC3 Ovhd C4	No	Bad Value	On	0.300	0.518	0.637	2.500	
08AI615.PV	DC3 Btm C3	No	Bad Value	On	1.000	2.004	1.919	3.000	
08TC421.OP	DC3 Btm Temp valve	No	Bad Value	On	20.000	26.289	25.863	80.000	

Messages Last: 50

Timestamp	Application	Message (pending)
1/23/2019 2:57:40 PM	HGP1DMC3ST	Independent 08PC504.SP: Variable has invalid value
1/23/2019 2:57:40 PM	HGP1DMC3ST	Independent 08PC404.SP: Variable has invalid value
1/23/2019 2:57:40 PM	HGP1DMC3ST	Independent 08TC421.SP: Variable has invalid value
1/23/2019 2:57:40 PM	HGP1DMC3ST	Independent 08FC413.SP: Variable has invalid value
1/23/2019 2:57:40 PM	HGP1DMC3ST	Independent 08FC412.SP: Variable has invalid value
1/23/2019 2:57:40 PM	HGP1DMC3ST	Independent 08TC230.SP: Variable has invalid value
1/23/2019 2:57:40 PM	HGP1DMC3ST	Independent 08PC104.SP: Variable has invalid value
1/23/2019 2:57:40 PM	HGP1DMC3ST	Independent 08FC101.SP: Variable has invalid value

到下一个周期，一切恢复正常。

APC: HGP1DMC3ST (APCTRNG) x +

localhost/atcontrol/operations.asp?appid=APCTRNG%5E6%5EHGP1DMC3ST%5Eall%20variables

Name	Description	Critical	Combined Status	Service Request	Operator Low Limit	Measurement	Steady State Value	Operator High Limit	Ramp Setpoint	
08FC413.SP	DC3 Liquid Propane	No	Pred Only	On	On	3020.854	3000.000	3020.854	15000.000	0.000
08TC421.SP	DC3 Bottoms Temp	No	Normal	On	On	269.490	255.000	269.267	270.000	0.017
08PC404.SP	DC3 Overhead Pressure	No	Min Move	On	On	270.781	255.000	270.781	275.000	-0.149
08PC504.SP	TANK1 Pressure	No	No Cost	On	On	264.026	242.000	264.026	265.000	0.000
08TI901.PV	Ambient Temperature	No	Normal	On		89.000		89.000		

Dependents Filter: None

Name	Description	Critical	Combined Status	Service Request	Operator Low Limit	Measurement	Steady State Value	Operator High Limit	Ramp Setpoint
08FC101.OP	DC2 Feed Valve	No	Normal	On	35.000	66.554	71.574	84.000	
08PC104.OP	DC2 Ovhd Press Valve	No	Hi Limit	On	41.000	79.423	80.000	80.000	
08FC220.OP	FURN1 Fuel gas valve	No	Normal	On	10.000	13.215	27.806	70.000	
08FC412.OP	DC3 Reflux valve	No	Normal	On	30.000	59.166	59.698	75.000	
08FC413.OP	DC3 Liq propane valve	No	Out Eng	On	20.000	30.326	0.643	50.000	
08FC422.OP	DC3 Steam valve	No	Normal	On	37.000	42.645	44.091	65.000	
08PD406.PV	DC3 Cond DP	No	Normal	On	5.000	6.183	7.243	12.600	
08PD409.PV	DC3 DP	No	Normal	On	1.600	1.912	1.972	2.200	
08TI403.PV	DC3 Ovhd Temp	No	Hi Limit	On	124.000	128.407	130.000	130.000	
08LC411.PV	DC3 Ovhd Level	Yes	Ramp	On	30.000	57.380	52.253	70.000	50.000
08PC404.OP	DC3 Ovhd Press Valve	No	Normal	On	30.000	61.523	69.746	70.000	
08PC504.OP	TANK1 Press Valve	No	Normal	On	20.000	42.525	42.331	78.000	
08AI414.PV	DC3 Ovhd C2	No	Normal	On	0.400	0.690	0.671	1.500	
08AI415.PV	DC3 Ovhd C4	No	Normal	On	0.300	0.554	1.824	2.500	
08AI615.PV	DC3 Btm C3	No	Normal	On	1.000	2.033	2.111	3.000	
08TC421.OP	DC3 Btm Temp valve	No	Normal	On	20.000	27.269	29.754	80.000	

Messages Last: 50

Timestamp	Application	Message (pending)
1/23/2019 2:58:40 PM	HGP1DMC3ST	Independent 08FC413.SP: MV forced to feedforward by engineering switch
1/23/2019 2:36:13 PM	HGP1DMC3ST	Dependent 08FC413.OP: Out-of-service: Operator=On Engineer=Off
Timestamp	Application	Message
1/23/2019 2:58:40 PM	HGP1DMC3ST	Independent 08TI901.PV: Variable has invalid value CLEARED.
1/23/2019 2:58:40 PM	HGP1DMC3ST	Dependent 08FC101.OP: Variable has invalid value CLEARED.
1/23/2019 2:58:40 PM	HGP1DMC3ST	Dependent 08PC104.OP: Variable has invalid value CLEARED.
1/23/2019 2:58:40 PM	HGP1DMC3ST	Dependent 08FC220.OP: Variable has invalid value CLEARED.
1/23/2019 2:58:40 PM	HGP1DMC3ST	Dependent 08FC412.OP: Variable has invalid value CLEARED.

注意，RTE 控制器的行为与传统的 ACO 控制器不同。ACO 控制器会跳过这个周期，等到下一个周期。在几个周期后，如果读取问题持续存在，控制器将由于其他错误（Watch Dog, WFAILM, ...）而退出。

本方案介绍了如何避免控制器因读取失败而关闭的临时解决方案。

临时解决方案

添加三个计算式可使控制器在切出之前，在可配置连续读取失败周期内保持开启状态。

首先：

- 在 **General** 类别下添加一个用户自定义参数 **Max_count** 用于存储允许连续读取失败周期数。

Variables	User Entries	Properties																				
<ul style="list-style-type: none"> Dependent <ul style="list-style-type: none"> General Independent <ul style="list-style-type: none"> Subcontroller Test Group 	<table border="1"> <thead> <tr> <th>Name</th> <th>Data Type</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>max_count</td> <td>Int32</td> <td>3</td> </tr> </tbody> </table>	Name	Data Type	Value	max_count	Int32	3	<table border="1"> <tbody> <tr> <td>Category</td> <td>UserDefined</td> </tr> <tr> <td>DefaultIOFlags</td> <td>IsInput, IsTuningValue</td> </tr> <tr> <td>Description</td> <td></td> </tr> <tr> <td>EntryLimits</td> <td>String[] Array</td> </tr> <tr> <td>IsApplicable</td> <td>True</td> </tr> <tr> <td>SecurityAccess</td> <td>StandardEntry</td> </tr> <tr> <td>Value</td> <td>3</td> </tr> </tbody> </table>	Category	UserDefined	DefaultIOFlags	IsInput, IsTuningValue	Description		EntryLimits	String[] Array	IsApplicable	True	SecurityAccess	StandardEntry	Value	3
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Description																						
EntryLimits	String[] Array																					
IsApplicable	True																					
SecurityAccess	StandardEntry																					
Value	3																					

- 对所有的独立变量添加用户自定义参数 **Ind_count** 和 **Vind_lastgood**，分别用于存储活动的连续失败周期，和最后一个可用的 **VINDSP** 值。

Variables	User Entries	Properties																							
<ul style="list-style-type: none"> Dependent <ul style="list-style-type: none"> General Independent <ul style="list-style-type: none"> Subcontroller Test Group 	<table border="1"> <thead> <tr> <th>Name</th> <th>Data Type</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>ind_count</td> <td>Int32</td> <td></td> </tr> <tr> <td>vind_lastgood</td> <td>Double</td> <td></td> </tr> </tbody> </table>	Name	Data Type	Value	ind_count	Int32		vind_lastgood	Double		<table border="1"> <tbody> <tr> <td>Category</td> <td>UserDefined</td> </tr> <tr> <td>DefaultIOFlags</td> <td>IsInput, IsTuningValue</td> </tr> <tr> <td>Description</td> <td></td> </tr> <tr> <td>EntryLimits</td> <td>String[] Array</td> </tr> <tr> <td>IsApplicable</td> <td>True</td> </tr> <tr> <td>SecurityAccess</td> <td>StandardEntry</td> </tr> <tr> <td>Value</td> <td>0</td> </tr> </tbody> </table>	Category	UserDefined	DefaultIOFlags	IsInput, IsTuningValue	Description		EntryLimits	String[] Array	IsApplicable	True	SecurityAccess	StandardEntry	Value	0
Name	Data Type	Value																							
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DefaultIOFlags	IsInput, IsTuningValue																								
Description																									
EntryLimits	String[] Array																								
IsApplicable	True																								
SecurityAccess	StandardEntry																								
Value	0																								

- 对于所有的非独立变量添加用户自定义参数 **Dep_count**，用于存储活动的连续失败周期。

Variables	User Entries	Properties																				
<ul style="list-style-type: none"> Dependent <ul style="list-style-type: none"> General Independent <ul style="list-style-type: none"> Subcontroller Test Group 	<table border="1"> <thead> <tr> <th>Name</th> <th>Data Type</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Dep_count</td> <td>Int32</td> <td></td> </tr> </tbody> </table>	Name	Data Type	Value	Dep_count	Int32		<table border="1"> <tbody> <tr> <td>Category</td> <td>UserDefined</td> </tr> <tr> <td>DefaultIOFlags</td> <td>IsInput, IsTuningValue</td> </tr> <tr> <td>Description</td> <td></td> </tr> <tr> <td>EntryLimits</td> <td>String[] Array</td> </tr> <tr> <td>IsApplicable</td> <td>True</td> </tr> <tr> <td>SecurityAccess</td> <td>StandardEntry</td> </tr> <tr> <td>Value</td> <td>0</td> </tr> </tbody> </table>	Category	UserDefined	DefaultIOFlags	IsInput, IsTuningValue	Description		EntryLimits	String[] Array	IsApplicable	True	SecurityAccess	StandardEntry	Value	0
Name	Data Type	Value																				
Dep_count	Int32																					
Category	UserDefined																					
DefaultIOFlags	IsInput, IsTuningValue																					
Description																						
EntryLimits	String[] Array																					
IsApplicable	True																					
SecurityAccess	StandardEntry																					
Value	0																					

然后添加以下两个计算式，其中一个给独立变量，另一个给非独立变量：

1. 独立变量 (Independents)

'此计算将重置 *ind* 状态，直到不良状态计数超过最大计数为止'

```

If FirstRun <> 1 Then
  If Ind.level = qlevel_good then
    Ind_count = 0
  End If

```

```

If Ind.level = qlevel_bad and Ind_count < max_count Then

```

```

    Ind.level = qlevel_good
    Ind_count = Ind_count + 1
  End if
End if

```

Enter Calculation

```

'This calculation resets Ind status until bad status count is past max count
'
If(FirstRun <> 1) then
  If (Ind.level = qlevel_good) then
    Ind_count = 0
  End If
  If Ind.level = qlevel_bad and Ind_count < max_count then
    Ind.level = qlevel_good
    Ind_count = Ind_count + 1
  End if
End If

```

Map Calculation Variables

Name	Mode	Binding	Entry	Value
FirstRun	Input	Entry	/General/FirstRunIndicator	
ind	InputOutput	Entry	/Independent/*/Measurement	
ind_count	InputOutput	Entry	/UserDefined/Independent*/ind_count	
max_count	Input	Entry	/UserDefined/General/max_count	

参数映射如上图所示。

2. 非独立变量 (Dependents)

'此计算将重置 Dep 状态，直到不良状态计数超过最大计数为止'

```

If FirstRun <>1 Then
  If Dep.level = qlevel_good then
    Dep_count = 0
  End If
'

  If Dep.level = qlevel_bad and Dep_count < max_count Then
    Dep.level = qlevel_good
    Dep_count = Dep_count + 1
  End if
End if

```

Enter Calculation

```

' This calculation reset Dep status until bad status count is past max count
'
If FirstRun <>1 Then
  If Dep.level = qlevel_good then
    Dep_count = 0
  End If
'
  If Dep.level = qlevel_bad and Dep_count < max_count Then
    Dep.level = qlevel_good
    Dep_count = Dep_count + 1
  End if
End if

```

Map Calculation Variables

Name	Mode	Binding	Entry	Value
Dep	InputOutput	Entry	/Dependent*/Measurement	
Dep_count	InputOutput	Entry	/UserDefined/Dependent*/Dep_count	
FirstRun	Input	Entry	/General/FirstRunIndicator	
max_count	Input	Entry	/UserDefined/General/Max_count	

参数映射如上图所示。

添加一个输出计算式，用于当读到不良值而控制仍开启时绕过控制器动作。

```

' set vindsp = vind if count > 1
'
If FirstRun <>1 Then
  If Ind_count = 0 Then
    vind_lastgood = vind
  End if
'
  If (Ind_count > 0 and MasterOnOffStatus = 1)Then
    Vindsp = vind_lastgood
  End if
End if

```

Enter Calculation

```

' set vindsp = vind if count > 1
,
If (FirstRun <> 1) then
  If (Ind_count = 0) then
    vind_lastgood = vind
  End If
  If ind_count > 0 and MasterOnOffStatus = 1 Then
    Vindsp = vind_lastgood
  End if
End If

```

Map Calculation Variables

Name	Mode	Binding	Entry	Va
FirstRun	Input	Entry	/General/FirstRunIndicator	
Ind_count	Input	Entry	/UserDefined/Independent*/ind_count	
MasterOnOffStatus	Input	Entry	/General/MasterOnOffStatus	
vind	Input	Entry	/Independent*/Measurement	
vind_lastgood	InputOutput	Entry	/UserDefined/Independent*/vind_lastgood	
Vindsp	Output	Entry	/Independent*/Setpoint	

参数映射如上图所示。

修复版本

在将来版本修复

关键词

RTE read failure, All Bad Value, Chinese, 中文