ABB

Product Alert

ALERT - PROFIBUS I/O on CI854A might Freeze Without Error Indication

Products Concerned

Communication Interface PROFIBUS DP-V1 CI854AK01, 3BSE030220R1, PR:J

Units having Serial Number larger than SI134472536 or have an Inspection Date later than 20131120 might be affected by this problem.

Description

A severe problem with the CI854A Communication Interface is under investigation by ABB. The problem can result in I/O from the affected Profibus line stopping to update inputs or outputs or both, without any error indication by the CI854. Since the CI854 does not detect or report the error no redundancy switch over to a redundant CI854 will happen.

When the problem occurs either all outputs are not updated anymore and keep the values from before the error or all input values are not updated and also keep the values from before the error. In some cases both all inputs and all outputs can be affected.

In the failure case for inputs the channel status of the I/O is not set into error state and for outputs no OSP (Output Set as Predetermined) is activated. If however the controller is halted, all inputs/output will go to ISP/OSP

Also other error reactions such as CI854 internal watchdog timeout has been observed. See below for example of printout example from controller log.

The problem is only affecting specific CI854 individuals. Of the total quantity of CI854 units within the scope for this field communication less than 1% have reported the problem.

Identifying possibly affected CI854 Units

Units that might be affected by this problem can be identified in two ways:
- Serial Number larger than SI134472536 (identified on the product label)
- Inspection date later than 20131120 (identified through the Webserver - see details below).

The Inspection Date is found in the CI854 Service file collected via Webserver. See Manual *PROFIBUS DP 3BDS009030*,* section 5 how to access the Webserver. Create a service file selecting "Create CI854 service file" in the upper left corner of the browser window.Example:

```
--Hardware Info
Module Type       : CI854K01
Order Number      : 3BSE030220R1
Serial Number     : 55974698
HW Change Index   : 0401
NL Number         : 000000
Inspection Station : 01
Inspection Date    : 20140228
Product Revision  : J
```

Note: Serial Number in Webserver is a part of the Serial Number on the Product Label but cannot be used to identify the unit according this field communication.

ABB AB

Doc. Id. 3BSE082387   Rev. -   Date. 2015-03-18   1 (4)

File: 3BSE082387.docx; 1.17 Saved Date: 2015-03-18 13:12; Template: PRODUCT ALERT.DOTX, 3BSE052609 Rev B; Safety Impact: 2-medium

ABB

Identifying the active problem

While the problem is occurring this can be confirmed by using Web Server against the suspected CI854A and show the following memory area Debug -> CM_P -> ACC_CM

Press the Read Button repeatedly (at least 5 times). If the values within the blue rectangles are not reading 0 values any time the problem described is present.

Example from controller log file if CI854 watchdog timeout have occurred:
```
E 2014-12-30 21:35:21.814   641 Watchdog time out  1  0  0 CI854StatusBase.cpp
I 2014-12-30 21:35:21.814  D-Time: 200030 µs
I 2014-12-30 21:35:21.815   4D0A 3000 00000020 00000002  ... ....  SUN JAN 01
I 2014-12-30 21:35:21.816   CD0B 3000 00000020 00000002  ... ....  SUN JAN 01
I 2014-12-30 21:35:21.816 ->3A00 A022 00000000 00000000 .... ....  TUE DEC 30
I 2014-12-30 21:35:21.816  Status: 00A00000 00010000 00020000
W 2014-12-30 21:35:21.817 Watchdog DE_TIMEOUT at address 1
```

Corrective Action or Resolution

If using CI854A units produced during the mentioned time span a software / hardware watchdog is recommended to be implemented for each CI854 to detect the I/O freeze problem. The watchdog could consist of toggling a digital output and supervise that the toggled signal is detected by a digital input wired to the output at the same CI854. Also analog signals can be used to create a watchdog.

If an I/O freeze is detected actions should if possible be taken to shut down process with I/O not connected to the affected CI854 unit.

If no other trip or shutdown mechanism is possible a halt of the controller can be forced by calling the Function Block *ErrorHandler.*

Example how to create a Watchdog in the applications program:
```
TOn ( In := xor (In.Value, Out.Value),
      PT := Timeout );
ErrorHandler(TOn.Q,5);
Out.Value := Not In.Value;
```

⚠️ *Observe, this type of code must be disabled during startup and if maintenance is performed on I/O etc. else the controller will shut down when timeout has expired.*

ABB AB

Correction

Investigation of this problem is still ongoing and this Alert will be updated when root cause is determined. It is not possible to deliver CI854A units with earlier Inspection Date or older PR: revision.

A Temporary Correction to diagnose the CI854 I/O freeze problem is being developed but not yet available. The diagnostics will reset an affected CI854 upon error detection. If this temporary correction for the diagnostics is requested please contact ABB Support Line.

ABB AB

ABB

REVISION

Rev.ind.	Page (P) Chapt. (C)	Description	Date Dept.
-	All	New Product Alert	2015-03-16

ABB AB