

Application Notes Affected: AN2005-006 revision 1.5

and

WITS PSA Test Specification, all versions

Bulletin Reference: **TB0051 Iss 3**

Bulletin Type: **Clarification / Addition**

Status: ~~Circulated for comment / Rejected~~ / **Accepted**

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1 Overview

It has been observed that several Field Device vendors have misinterpreted the Application Notes regarding the use of Incremental Configuration to configure a Field Device with a mix of static limit thresholds and profiles.

AN2005-006 section 2.1.2.4 includes the verification rule “The limits must be set in ascending order of limit value with PLI otherwise the Field Device will return error code 25.” Consider the example where an analogue point is being configured to use limit thresholds:

Low low = 10
Low = 20
High = 70
High high = 80

This configuration requires 4 Incremental Configuration (IC) records of type 1003, defining:

PLI = 1 with limit value = 10
PLI = 2 with limit value = 20
PLI = 3 with limit value = 70
PLI = 4 with limit value = 80

This configuration obeys the verification rule shown above.

However, if the requirement is to use a profile every day of the week for the “High” limit then the point is being configured to use limit thresholds:

Low low = 10
Low = 20
High = value from the profile
High high = 80

This configuration still requires 4 IC records, defining:

PLI = 1 with limit value = 10
PLI = 2 with limit value = 20
PLI = 3 with limit value = xx
PLI = 4 with limit value = 80

When the Master Station creates the IC record for PLI 3 it doesn't have a limit value to put into the IC record. There is no rule about what value to put in the record, so any arbitrary value can be in the record. In this case the limit value in the record for PLI 3 is not used and the Field Device must apply the above verification rule to only the limit values that are being used. If the Master Station chooses to use a value of 0 for an unused static limit value then the 4 records:

PLI = 1 with limit value = 10
PLI = 2 with limit value = 20
PLI = 3 with limit value = 00
PLI = 4 with limit value = 80

are valid and must not be rejected by the Field Device.

This Technical Bulletin clarifies the use of a mix of static limits and profiles and adds tests to the PSAC Test Specification to ensure valid configurations are not rejected by Field Devices.

NB. In section 2 onwards, text that is shown in **red** represents words to be removed from the Application Notes and Test Specification and text in **blue** represents words to be inserted into the Application Notes and Test Specification.

2 Changes to the Application Notes

For all parts of the Application Notes being modified ensure the dates and revision numbers in the footers are updated.

2.1 AN2005-006, clarifying profiles and unused limit values

Make the following changes to AN2005-006 for both WITS streams. Note TB#46 and TB#47 already makes changes to this Application Note. After making the changes identified in TB#46 and TB#47:

2.1.1 Change front page as shown:

~~September 2014~~ ~~October 2014~~

2.1.2 Add to the “Change History” as shown:

Date	Revision	WITS-DNP3 Version	Details
September 2014 October 2014	1.6		Correct the heading for “Interpolation Time” in 2.1.2.17. Added note to 2.1.2.10 to reject IC requests for action 2 or 3 if point is assigned to DNP3 class 0. Removed erroneous cross-reference from IC records 1003 and 1004 description of PLI. Corrected text in “End of Period Action” from state counter to state runtime. Clarify the use of a sample time of 0 to disable sampling in section 2.1.2.18 Added note about persistence to the end of section 2.1.2.7 Added clarification about profiles and unused limit values to section 2.1.2.4 and 2.1.2.5

2.1.3 Add to section 2.1.2.4 as shown:

Add the clarification to rule 1 as shown:

- 1 The limits must be set in ascending order of limit value with PLI otherwise the Field Device will return error code 25. [Note that when a profile is being used every day of the week there is no static limit value being used. In this case the “unused” limit value can contain any arbitrary value and must not be included in any validation checks being done by the Field Device.](#)

Add the clarification to the details of “Limit Value” as shown:

Limit Value (Element 7)

The limit value defines the threshold for this limit. The limit value is in engineering units, and the Field Device must store it in engineering units (not just the equivalent raw value), so that it is not affected by any subsequent change to the scaling of the point (see section 2.1.2.2). The Field Device will reject any configuration that has the same Limit Value on adjacent Point Limit Indices by reporting error code 25 in the log file.

[Note that when a profile is being used every day of the week then the limit value is not used and can contain any arbitrary value. In this case the Field Device must not perform any validation using the limit value.](#)

2.1.4 Add to section 2.1.2.5 as shown:

Add the clarification to rule 1 as shown:

- 1 The limits must be set in ascending order of limit value with PLI otherwise the Field Device will return error code 25. *Note that when a profile is being used every day of the week there is no static limit value being used. In this case the “unused” limit value can contain any arbitrary value and must not be included in any validation checks being done in the Field Device.*

Add the clarification to the details of “Limit Value” as shown:

Limit Value (Element 6)

The limit value defines the threshold for this limit. The Field Device will reject any configuration that has the same Limit Value on adjacent Point Limit Indices by reporting error code 25 in the log file.

Note that when a profile is being used every day of the week then the limit value is not used and can contain any arbitrary value. In this case the Field Device must not perform any validation using the limit value.

3 Changes to the WITS PSA Test Specifications

The following changes are made to all versions of the specification and should be combined with the changes identified in earlier Technical Bulletins. Note that the test numbers are those relevant to Test Specification version 1.1b. The test numbers will need to be revised for other versions of the Test Specification.

3.1.1 Amend the revision details as shown:

Amend the date and revision on the front page to show the relevant revision and a date of October 2014.

Amend the document footer to show the relevant revision and a date of October 2014.

Add an entry to the change history, dated October 2014 with the relevant revision and protocol version and details as shown:

Date	Revision	WITS-DNP3 Version	Details
October 2014			Added tests to section 2.5.5 to ensure a mix of static limits and profiles are accepted by the Field Device.

3.1.2 Add to section 2.5.5, as shown:

Test	Test procedure	Expected result	MS result	FD result
2.5.5.7	Use the profile configured in test 2.5.5.1. Using incremental configuration, create an analogue limit definition so that it uses this limit profile every day of the week for limit threshold 1 (PLI = 1). Configure 3 more limit thresholds, ensuring the static limit values are greater than those in the profile. Download and activate the incremental configuration file. Perform this test for each of the supported analogue point types.	The Field Device accepts the incremental configuration. Analogue input: Analogue output:		
2.5.5.8	Change PLI 1 to be a static limit and PLI 2 to use the limit profile every day of the week. Download and activate the incremental configuration file. Perform this test for each of the supported analogue point types.	The Field Device accepts the incremental configuration. Analogue input: Analogue output:		
2.5.5.9	Create a second profile for use with the analogue point(s), ensuring the limit values in the profile are larger than those in the first profile. Change PLI 3 to use the second limit profile every day of the week. Download and activate the	The Field Device accepts the incremental configuration.		

	incremental configuration file. Perform this test for each of the supported analogue point types.	Analogue input: Analogue output:		
2.5.5.10	Use the profile configured in test 2.5.5.4. Using incremental configuration, create a counter limit definition so that it uses this limit profile every day of the week for limit threshold 1 (PLI = 1). Configure 2 more limit thresholds, ensuring the static limit values are greater than those in the profile. Download and activate the incremental configuration file.	The Field Device accepts the incremental configuration.		
2.5.5.11	Change PLI 1 to be a static limit and PLI 2 to use the limit profile every day of the week. Download and activate the incremental configuration file.	The Field Device accepts the incremental configuration.		
2.5.5.12	Change PLI 2 to be a static limit and PLI 3 to use the limit profile every day of the week. Download and activate the incremental configuration file.	The Field Device accepts the incremental configuration.		