

Title: **TECHNICAL EVALUATION
CRITERIA FOR DIGITAL
TRANSDUCER-BASED
MEASUREMENT SYSTEM FOR
ELECTRICAL QUANTITIES**

Document Identifier: **240-185000396**

Alternative Reference Number: **N/A**

Area of Applicability: **National Transmission
Company South Africa**

Functional Area: **Engineering**

Revision: **1**

Total Pages: **16**

Next Review Date: **N/A**

Disclosure Classification: **Controlled Disclosure**

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Date: 24 March 2025

Date: 24 March 2025

Date: 25/03/2025

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1. Introduction

This document provides an overview of NTCSA's technical evaluation criteria to be used when evaluating tender submissions for the enquiry for digital transducers.

The report defines the 'Mandatory', 'Supplier Equipment Tendered Declaration', 'Technical Qualitative', 'Laboratory Evaluation', 'SCADA Integration and Protocol Testing' and 'Deemed Offer Risk(s)' criteria that may be used to evaluate responses to the enquiry.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

This document provides the technical evaluation criteria relating to a commercial enquiry for the supply of digital transducer-based measurements systems for electrical quantities for use within NTCSA. The enquiry includes the following group of digital transducer-based measurement systems as per the items defined in the standard for digital transducer-based measurement system for electrical quantities (240-51999977):

Table 1: Group 1

Item	Description
1	Digital transducer only – no analogue outputs
4	Digital display

Table 2: Group 2

Item	Description
2	Digital transducer only – 4 analogue outputs
4	Digital display

Table 3: Group 3

Item	Description
3	Digital transducer only – 6 analogue outputs
4	Digital display

Table 4: Group 4

Item	Description
8	2 x independent digital transducers – no analogue outputs fitted inside a 19" rack with 2 x independent digital displays
9	2 x independent digital transducers – 4 analogue outputs per transducer fitted inside a 19" rack with 2 x independent digital displays
10	2 x independent digital transducers – 6 analogue outputs per transducer fitted inside a 19" rack with 2 x independent digital displays

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2.1.2 Applicability

This document shall apply throughout National Transmission Company South Africa SOC Ltd Reg No 2021/539129/30.

2.2 Normative/Informative References

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

- [1] 240-519999977: Specification for digital transducer-based measurement system for electrical quantities
- [2] 240-76624509: Control of new metering product and version changes in technical, software, firmware and hardware
- [3-AB] 240-519999977 Item 1 Digital transducer only – no analogue outputs AB Schedules
- [4-AB] 240-519999977 Item 2 Digital transducer only – 4 analogue outputs AB Schedules
- [5-AB] 240-519999977 Item 3 Digital transducer only – 6 analogue outputs AB Schedules
- [6-AB] 240-519999977 Item 4 Digital display AB Schedules
- [7-AB] 240-519999977 Item 8 2 x digital transducer – no analogue outputs fitted inside a 19" rack with 2 x independent digital displays AB Schedules
- [8-AB] 240-519999977 Item 9 2 x digital transducer – 4 analogue outputs fitted inside a 19" rack with 2 x independent digital displays AB Schedules
- [9-AB] 240-519999977 Item 10 2 x digital transducer – 6 analogue outputs fitted inside a 19" rack with 2 x independent digital displays AB Schedules

2.2.2 Informative

None.

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2.3 Definitions

2.3.1 General

Definition	Description
19"	Unit used to describe the width of panel equipment. 19" = 482,6 mm
Normative	Documents that shall be read in conjunction with this report and are binding on Tenderers.
Rack	The 19" three-unit (3U) rack.
Technical evaluation team	The persons appointed by NTCSA to perform the technical evaluation of tender submissions in line with NTCSA's requirements.
Transducer	A device intended to transform, with a specified accuracy and based on some measurement theory that predicts how a value will behave when a certain measurement procedure is applied.
U	Unit used to describe the height of panel equipment. One unit (1U) = 44,45 mm.

2.3.2 Disclosure classification

Controlled disclosure: controlled disclosure to external parties (either enforced by law, or discretionary).

2.4 Abbreviations

Abbreviation	Explanation
NTCSA	National Transmission Company South Africa
RTU	Remote Terminal Unit
SCADA	Supervisory Control and Data Acquisition

2.5 Roles and Responsibilities

- NTCSA shall utilise this document as the basis for the technical evaluation process of digital transducer-based measurement systems.
- Tenderers shall note the evaluation criteria as laid out in this document and submit tenders in compliance to the stipulated requirements.
- Tenderers shall complete the 'Supplier Equipment Tendered Declaration Form' to enable NTCSA to determine if a technical evaluation is required (at NTCSA's discretion previously evaluated equipment may be exempt). Note that a complete tender is still a requirement.

2.6 Process for Monitoring

Not applicable.

2.7 Related/Supporting Documents

Not applicable.

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3. Technical Tender Evaluation Procedure

The following criteria will be used to assess the tenderer's technical capability to enter into a contract with NTCSA with respect to the supply of Digital Transducers. The evaluation method has six (6) main stages as follows:

- 1) Mandatory Requirements Evaluation
- 2) Supplier Equipment Tendered Declaration Evaluation
- 3) Technical Qualitative Requirements Evaluation
- 4) Laboratory Evaluation
- 5) SCADA Integration Protocol Testing
- 6) Deemed Offer Risk(s) Evaluation

Tenderer's offer must achieve at least the threshold for each stage, where applicable, in order to qualify for evaluation under a subsequent stage. Tenderers that do not achieve at least the threshold for a stage, where applicable, will not be evaluated further. The detailed methodologies for scoring in each stage, where applicable, are provided in Sections 3.1 to 3.6 below.

3.1 Mandatory Requirements Evaluation

The mandatory requirements are listed in Table 5 below. Tenderers are required to complete the mandatory requirements for each tendered item on the respective "Mandatory Requirements" Excel sheet in normative references [3-AB] to [9-AB].

Table 5: Mandatory Requirements

Mandatory Criteria	Enquiry returnable	Returnable required at tender closing (disqualifiable)	Returnable required at non-tender closing (non-disqualifiable)	Returnable required prior to contract award
Are completed Technical A&B Schedules, including any deviations, submitted?	Completed Technical A&B Schedules as in normative reference [3-AB] to [9-AB]	✓		
Are the transducer type test certificates and type test reports submitted?	Type test certificates from approved test facility (test facility accredited by a full member facility that is listed at ILAC)			✓
Are completed Support Schedules, including any deviations, submitted?	Completed Support Schedules as in normative reference [3-AB] to [9-AB]	✓		
Completed Quality, Risk and Support Questionnaire in Annex B, Table B.1	Completed Quality, Risk and Support Questionnaire in Annex B, Table B.1		✓	

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The technical evaluation team will go through the details of the returnable submissions that are required at tender closing (disqualifiable) and will ensure that all the Mandatory Requirements are met. Submissions that receive a “No” for any of these requirements will not be evaluated further and therefore will fail the technical evaluation.

The technical evaluation team will go through the details of the returnable submissions that are required at tender closing (non-disqualifiable) and will ensure that all the Mandatory Requirements are met. Submissions that receive a “No” for any of these requirements will result in a request being sent to the tenderer for the outstanding returnables to be submitted within five (5) working days. Tenderers who do not meet this requirement will not be evaluated further and therefore will fail the technical evaluation.

3.2 Supplier Equipment Tendered Declaration Evaluation

The tenderers are required to complete the ‘Supplier Equipment Tendered Declaration’ form in Annex A of this document. At NTCSA’s discretion, previously evaluated equipment may be exempt from further technical evaluation, where NTCSA’s specifications have not changed and the tenderer has submitted a technical bid comprising of equipment previously tendered, and having been evaluated as acceptable by Eskom / NTCSA.

3.3 Technical Qualitative Evaluation

Tenderers are required to complete the “Technical A&B Schedule” and “Support Schedule” Excel sheet for each item tendered as listed in normative references [3-AB] to [9-AB]. This stage will be adjudicated a score out of 100% based on the evaluation of the submitted Technical A&B Schedules and the Support Schedules. The Technical Qualitative Evaluation shall be made up of scoring in two sub-categories and shall be adjudicated a score out of 100% as follows:

Table 6: Technical Qualitative Evaluation scoring breakdown

Phase 1 - Technical sub-category	Weighting	Score
Technical A&B Schedules	60	
Support Schedules	40	
Total	100	
Minimum Threshold	85%	

Only tenderers that meet a minimum threshold of 85% for this stage shall proceed to the next stage of the technical evaluation (Laboratory Demonstration). Tenders that do not meet the minimum threshold shall be disqualified and will not be evaluated further. The detailed scoring methodologies in each sub-category are defined in the following sections.

3.3.1 Technical sub-category: Technical A&B Schedules

This sub-category comprises of the evaluation of the “Technical A&B Schedules” Excel sheet for each tendered item. The Technical A&B Schedules use a default weight of 1 for each scored item. Critical items are assigned higher weights. Each item will be assigned a score by the technical evaluation team member based upon the tendered response and cross-checked with the supporting documents provided, using Table 7.

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Table 7: Scoring on items in Technical A&B Schedules

Criteria	Score
Fully compliant	3
Partially compliant (minor deviation)	1
Non-compliant (major deviation)	0

Tender responses claiming compliance to an item (e.g. 'Comply') but which are found to be partially compliant or non-compliant during verification will be assigned the corresponding score by the technical evaluation team. Items for which compliance is not claimed (e.g. 'Do Not Comply'), but which are found to be compliant during verification will be scored as 'Non-compliant' or 'Partially compliant', based on the original response. Items for which no response is provided shall automatically be scored as 'Non-compliant'.

The score for each item will be multiplied by its weight to obtain the total score per item. All scores for the Technical A&B Schedules will be tallied and shall be calculated based on the maximum possible score (Weight x (Score from Table 7)). This value will be recorded as the equivalent total out of a score of 60% in Table 8.

Table 8: Technical A&B Schedules evaluation scoring breakdown

Technical sub-category	Weighting	Score	Comment
Technical A&B Schedules	60%		

In addition to this, Tenderers are required to:

- For Group 1: pass the minimum threshold for item 1
- For Group 2: pass the minimum threshold for item 2
- For Group 3: pass the minimum threshold for item 3
- For Group 4: pass the minimum threshold for item 10

3.3.2 Technical sub-category: Support Schedules

Tenderers are required to complete a separate "Support Schedule" Excel sheets for each item being offered in the schedules provided in normative references [3-AB] to [9-AB]. The technical evaluation team will evaluate the support capability of the supplier / product based on the completed Support Schedule. Each item will be assigned a score by the technical evaluation team member based upon the tendered response and cross-checked with the supporting documents provided, using Table 9.

Table 9: Scoring on items in Support Schedules

Criteria	Score
Fully compliant	3
Partially compliant (minor deviation)	1
Non-compliant (major deviation)	0

Tender responses claiming compliance to an item (e.g. 'Comply') but which are found to be partially compliant or non-compliant during verification will be assigned the corresponding score by the technical evaluation team. Items for which compliance is not claimed (e.g. 'Do Not Comply'), but which are found to be compliant during verification will be scored as 'Non-compliant' or 'Partially compliant', based on the original response. Items for which no response is provided shall automatically be scored as 'Non-compliant'.

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All scores for the Support Schedules will be tallied and shall be calculated based on the maximum possible score (Weight x (Score from Table 9)). This value will be recorded as the equivalent total out of a score of 40% in Table 10.

Table 10: Support Schedules evaluation scoring breakdown

Technical sub-category	Weighting	Score	Comment
Support Schedules	40%		

3.4 Laboratory Demonstration – Transducer and software evaluation

Tenderers that have qualified for this stage of the evaluation will be notified of their respective dates for the laboratory evaluation that will be conducted in the NTCSA / Eskom premises in Gauteng.

Suppliers are required to provide a sample of all the variants of transducers and display items offered, to be subjected to configuration and testing, on the day of the laboratory demonstration. In addition, if a supplier offers 19" rack variants then a sample rack of item 10 is required for evaluation. The sample for item 10 shall have a minimum of 1 x transducer and 1 x display but the wiring in the rack shall be for complete rack i.e. 2 x transducers and 2 x display. Prototype transducers, displays and their respective software shall be functionally evaluated and tested against the requirements of the respective specifications and allocated a score based on the criteria listed below.

Suppliers are required to demonstrate the following use cases:

Table 11: Use cases for transducer software evaluation

	Criteria	Score
1	Installation of configuration software on Eskom Windows Operation System (Windows 10).	
2	Configuration of the transducer for different applications i.e. voltage, current, active power, reactive power, frequency, power factor and combinations thereof.	
3	Configuring the transducer for interfacing with the SCADA system utilising a protocol supported by the device i.e. Modbus and IEC 61850.	
4	Configuring the display utilising the software	
5	Configuring the transducer analogue outputs for 0-5 mA and 4-20mA (if software selectable).	
6	Configuring the response time on the transducer (if the response time is configurable via software).	
7	Security features of the software.	

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The laboratory testing, conducted by NTCSA technical staff, on the supplier's transducers will entail the following use cases:

Table 12: Use cases for transducer evaluation

	Criteria	Score
1	Accuracy testing of transducers at defined test points.	
2	Accuracy testing of transducers under harmonic condition.	
3	Communication between transducer and display.	
4	Response time on the analogue outputs.	
5	Ripple content on the analogue outputs.	
6	Burdening on analogue outputs.	
7	Short time withstand current.	
8	Short time withstand voltage.	

The NTCSA technical team will evaluate the following physical properties and attributes of the transducers, displays and racks as follows:

Table 13: Use cases for the transducer, 19" rack and display evaluation

	Criteria	Score
1	Terminal arrangements.	
2	Dimensions.	
3	Communication ports	
4	Internal connections	

This stage shall be adjudicated a score out of 100% with a minimum threshold for qualification of 85% required to proceed to next stage of the technical evaluation. Each use case in Tables 11, 12 and 13 will be assigned a score by the technical evaluation team member using Table 14, providing the reasoning for each score.

Table 14: Scoring on items Transducer and Software evaluation

Criteria	Score
Fully compliant	3
Partially compliant (minor deviation)	1
Non-compliant (major deviation)	0

All scores from Tables 11, 12 and 13 will be tallied and shall be calculated based on the maximum possible score (Weight x (Score from Table 14)). This value will be recorded as the equivalent amount out of a score of 100% in Table 15.

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Table 15: Laboratory Demonstration evaluation scoring breakdown

Technical sub-category	Weighting	Threshold	Score	Comment
Laboratory Demonstration	100%	85%		

Only submissions that pass the Laboratory Demonstration evaluation scoring threshold of **85%** will proceed to the next stage of the evaluation.

3.5 SCADA Integration and Protocol Testing

The technical evaluation team shall conduct integration testing to the NTCSA SCADA systems (RTUs and Bay processors) over the protocols supported by the transducers. The prototype transducers submitted for the laboratory demonstration will be used for the SCADA integration testing will include the following verification tests:

Table 16: SCADA Integration and Protocol Test Criteria

	Test criteria	Score
1	Verifying the transducer outputs to the SCADA system utilising the protocols supported by the device for different test points.	
2	Verifying the accuracy of the digital signal to the SCADA system utilising the protocols supported by the device for different test points.	
3	Verify the response time on the digital signal to the SCADA system utilising the protocols supported by the device.	

Each item will be assigned a score by the technical evaluation team member using Table 17, based on the verification of the SCADA integration functionality and protocol tested against the requirements in Table 16.

Table 17: Scoring criteria on SCADA integration and Protocol testing

Criteria	Score
Fully compliant	3
Partially compliant (minor deviation)	1
Non-compliant (major deviation)	0

All scores for the SCADA Integration Testing will be tallied and shall be calculated based on the maximum possible score (Weight x (Score from Table 17)). This value will be recorded as the equivalent total out of a score of 100% in Table 18.

Table 18: SCADA integration testing scoring breakdown

Criteria	Weighting	Threshold	Score	Comment
SCADA Integration Testing	100%	95%		

Only submissions that pass the SCADA integration testing scoring threshold of **95%** will proceed to the next stage of the evaluation (deemed offer risk(s)).

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3.6 Deemed offer risk(s)

The technical evaluation team shall compile a narrative summarising risks associated with any aspect of the offer:

- a) noted during the Technical Qualitative Requirements Evaluation,
- b) noted during the Transducer and Software Evaluation during Laboratory Demonstrations,
- c) noted during the SCADA integration and protocol testing,
- d) based on the tenderers response to Quality, Risk and Support Questionnaire in Annex B, Table B.1.
- e) based on the deviations provided in the Deviation schedule Excel sheet to referenced technical standards, and
- f) based on any pricing anomalies, noted during the subsequent financial evaluation that cannot be acceptably clarified.

This narrative shall be used to determine and motivate whether the risk is deemed low / acceptable / high and will serve as input to the recommendation as to whether the offer should be accepted as shown in Table 19 below. Note, the technical evaluation team shall only have access to financial information post completion of the technical evaluation report. Any changes as a result of f) above will be included in an update to the technical evaluation report.

Table 19: Deemed Offer Risk(s) Evaluation

Criteria	Score	Comments
Deemed Offer Risk(s)		
Threshold	Acceptable	

4. Acceptance

Not applicable.

5. Revisions

Date	Rev	Compiler	Remarks
Mar 2025	1	S Letwaba	Document required for the issue of enquiry.

6. Development Team

The following people were involved in the development of this document:

- Mohamed Omar
- Samuel Letwaba

7. Acknowledgements

Not applicable.

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Annex A – Supplier Equipment Tendered Declaration Form

NTCSA reserves the right not to perform technical evaluation for tenders where the equipment has passed technical evaluation in the immediate previous enquiry and where NTCSA has made no changes to the specified requirements. For NTCSA to make this assessment, all suppliers are required to complete the declaration form below.

Table A.1: Supplier Equipment Tendered Declaration Form

	Question	Supplier Commitment
1	Has the offered equipment previously been tendered for, by your company, against the same enquiry specification? The equipment offered shall not have been modified in any way from the previous tender.	
2	If yes, provide the relevant reference details of the previous enquiry.	

Declaration

I confirm that the responses indicated in this questionnaire are true.

Name of Company Representative: _____

Signature: _____

Date: _____

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Annex B – Quality, Risk and Support Questionnaire

Tenderers are to indicate their response or any deviations to the 'Requirement' in the 'Response / Deviations' column.

Table B.1: Quality, Risk and Support Criteria

	Requirement	Response / Deviations
1	Ability to Deliver	
1.1	Briefly describe the nature of your resources in the Republic of South Africa e.g. workshop facilities, test equipment, etc	
1.2	Where the tenderer is not the Original Equipment Manufacturer (OEM) of the product, the license/supply agreements with OEM, their distributors and/or agents shall be in place, with proof of this provided by the tenderer in writing with the tender submission.	
1.3	Provide details of any similar projects that have been undertaken, including a list of references including customer details; quantities supplied, and date supplied	
1.4	Please stipulate the delivery lead time (in weeks) from date of order.	
2	Support	
2.1	Describe the availability of the technical support, and the access methods (08h00-17h00, 24 hour, Help Desk, Web Site, etc).	
2.2	Have your staff been trained on the items being offered?	
2.3	Does your staff have the ability to perform local R&D, local fault finding and repairs?	
2.4	Will the configuration software be supplied without any additional cost?	
3	Maintenance	
3.1	Describe the maintenance policy for the digital transducers offered, both during and after the warranty period.	
3.2	Describe the proposal/recommendations regarding maintenance of the digital transducers offered for the life of the system.	
3.3	Will the Supplier honour all warranties and guarantees if Eskom personnel perform maintenance functions on digital transducers?	
3.4	Describe any specialised test equipment required for maintenance that is generally not commercially available.	

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Declaration

I confirm that the responses indicated in this questionnaire are true and binding in terms of this proposal.

Name of Company Representative: _____

Signature: _____

Date: _____

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