

	Report	National Transmission Company South Africa
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Title: Scope of Work and Technical Evaluation Criteria for the Fibre Optic to X.21 Converter

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1. Introduction

The Fibre Optic to X.21 converters are generally used in larger Transmission stations where there are separate control rooms and/or containers which are connected via a fibre optic cable. The Teleprotection and on a few applications, the Control Plant equipment, use these converters to connect to Transmission Telecoms multiplexer (BME/MSAP) equipment at a different control rooms/containers but within the same Transmission station.

The existing Fibre Optic to X.21 converters are the ADD LL2100 units. The units have surpassed the manufacturers recommended life span of 10 years and most are approximately 20 years of age. Due to the age and the harsh substation environment, the ADD LL2100 units are failing. There are no spares available and these units cannot be repaired.

The replacement for the ADD LL2100 units is the FRM220-CH08 (fibre to X.21 converter) units. The FRM220-CH08 units were successfully tested and approved by NTCSA.

2. Supporting Clauses

2.1 Scope

The scope of work document provides the specification and technical evaluation criteria for the FRM220-CH08 Fibre Optic to X.21 converters.

2.1.1 Purpose

The document contains the technical specification and technical evaluation criteria to be used for evaluating the submissions for the FRM220-CH08, Fibre Optic to X.21 converter.

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] ISO 9001 Quality Management Systems

[2] 240-95399670, Telecommunications Network Interface Converters Standard.

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2.2.2 Informative

None.

2.3 Definitions

Definition	Description
Submission	The tender in accordance with the requirements of the enquiry
Technical evaluator	End-users, technical experts nominated by the end-user and Divisional technical functionaries with the necessary technical expertise.

2.4 Abbreviations

Abbreviation	Explanation
BER	Bit Error Rate
BME	Bandwidth Management Equipment
DCE	Data Communication Equipment
DTE	Data Terminal Equipment
EMI	Electromagnetic Interference
EMC	Electromagnetic Coupling
HMI	Human Machine Interface
ITU	International Telecommunications Union
LME	Line Matching Equipment
LT	Line Trap
MSAP	Multi-Service Access Platform
PLC	Power Line Carrier
TET	Technical Evaluation Team

2.5 Roles and Responsibilities

Not applicable.

2.6 Process for Monitoring

Not applicable.

2.7 Related/Supporting Documents

Not applicable.

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3. FRM220-CH08 Fibre to X.21 Converter

The complete FRM220-CH08 Fibre Optic to X.21 Converter unit consists of three components as listed in table 1.

Table 1: Components of the FRM220-CH08 Fibre to X.21 Converter Unit

Item Number	OEM Description	NTCSA SAP/ Material Number	NTCSA SAP/ Material Short Description
1	FRM220-CH08-FRM220-CH08 1U 19", 8 slots Multi-service platform	0759943	CONVERTER SGNL:FRM220-CH08;FIBRE;I/P 64
2	FRM220-CH08-DC48-FRM220-CH08 Chassis power modules 36-75VDC	0759941	MODULE PWR SUP:FRM220-CH08-DC48;CHASSIS
3	FRM220-X21-SC002-FRM220-X21-SC002 X.21 to fiber with X.21 cable, MM, 2km	0759942	MODULE COMM:FRM220-X21-SC002;SERIAL

- a) The supplier / tenderer to confirm the component "FRM220-CH08-FRM220-CH08 1U 19", 8 slots Multi-service platform" – SAP/Material 0759943 (item 1 in table 1), shall be provided for the complete FRM220-CH08 Fibre to X.21 Converter Unit.
- b) The supplier / tenderer to provide a detailed datasheet on the component, "FRM220-CH08-FRM220-CH08 1U 19", 8 slots Multi-service platform" – SAP/Material 0759943 (item 1 in table 1).
- c) The supplier / tenderer to confirm the component "FRM220-CH08-DC48-FRM220-CH08 Chassis power modules 36-75VDC" – SAP/Material 0759941 (item 2 in table 1), shall be provided for the complete FRM220-CH08 Fibre to X.21 Converter Unit.
- d) The supplier / tenderer to provide a detailed datasheet on the component, "FRM220-CH08-DC48-FRM220-CH08 Chassis power modules 36-75VDC" – SAP/Material 0759941 (item 2 in table 1).
- e) The supplier / tenderer to confirm the component "FRM220-X21-SC002-FRM220-X21-SC002 X.21 to fiber with X.21 cable, MM, 2km" – SAP/Material 0759942 (item 3 in table 1), shall be provided for the complete FRM220-CH08 Fibre to X.21 Converter Unit.
- f) The supplier / tenderer to provide a detailed datasheet on the component, "FRM220-X21-SC002-FRM220-X21-SC002 X.21 to fiber with X.21 cable, MM, 2km" – SAP/Material 0759942 (item 3 in table 1).

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4. Tender Technical Evaluation Criteria

- a) The assessments are performed to assess the tenderer's capability to enter a contract with NTCSA with respect to a specific product or service and meet NTCSA's requirements.
- b) This report and any actions that are listed or recommended because of the assessments are by no means a confirmation or guarantee that any contract will be entered into by NTCSA.
- c) Any actions undertaken by the tenderer as a consequence of this report is for the tenderer's account. Any liability for the said actions undertaken by the tenderer is not transferrable to NTCSA in any way.
- d) The assessment team has no authority or responsibility in the decision taken by NTCSA with respect to contracting for a product or service.
- e) Any statements, intentions and/or actions expressed by the assessment team during the assessment and after the assessment should not be interpreted as the awarding of a contract and does not constitute any liability to NTCSA with regards to contract placement or post-contract performance guarantees.
- f) The technical evaluation method has three sub-categories: Mandatory Criteria Evaluation, Desktop Evaluation and Sample Evaluation. The detailed methodologies for scoring in each sub-category are provided in sections 4.1 to 4.3 below.
- g) Tenderer's that do not achieve the minimum threshold for each of the sub-categories will not be evaluated further.

4.1 Mandatory Criteria Evaluation

This evaluation exercise is performed by the NTCSA evaluating representatives. This part of the technical evaluation starts when submissions are opened for the first time. The NTCSA evaluating representatives will peruse the tender submissions to ensure that the mandatory criteria are met (table 2). Submissions that receive a "No" on any of the mandatory criteria will not be able to proceed to the desktop evaluation and therefore will fail the technical evaluation.

Table 2: Mandatory Criteria Evaluation

Item	Criteria	Comply	Comments
2.1	Submission of completed Technical Schedules A & B listed in Annex A in this document (Written in English)		
2.2	The supplier/ tenderer to provide the detailed data sheets of the FRM220-CH08 Fibre to X.21 Converter Unit as stipulated in sections 3b), 3d) and 3f) in this document.		

4.2 Desktop Evaluation

Submissions that obtain a minimum pass mark of 100% for the desktop evaluation (Table 3) shall proceed to the sample evaluation.

The technical schedules A & B in Annex A in this document use a default weight of 1 for each scored item. Each item will be scored according to Table 5 and cross-checked against the supporting documents tendered.

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The total score for the technical schedules A & B will be expressed as a percentage of the maximum possible score of 24 (Items from technical schedules A & B x (score “3” from Table 5). This score value (percentage) will be recorded under item 3.1 in Table 3.

Table 3: Desktop evaluation

Item	Criteria	Score %	Actual	Comments
2.1	Compliance with Technical Schedules A & B in this document (Full compliance = 8 x 3 = 24 points (i.e. 100%)). Therefore, to pass the Desktop evaluation a total of 24 points out of the maximum 24 need to be scored.	100		
	Subtotal	100		
	Threshold	100		

4.3 Sample Evaluation

This evaluation exercise is performed at NTCSA's premises and consists of the supplier / manufacturer providing a sample FRM220-CH08 Fibre to X.21 Converter link, that is two FRM220-CH08 Fibre to X.21 Converter units.

The NTCSA representatives will evaluate the FRM220-CH08 Fibre to X.21 Converter sample link according to table 4 and Annex B in this document.

Table 4: Sample evaluation

Item	Criteria	Score %	Actual	Comments
3.1	Sample evaluation of the fibre optic to X.21 converters will follow Annex B in this document. (Full compliance = 2 x 3 = 6 points (i.e. 100%)). Therefore, to pass the Desktop evaluation a total of 6 points out of the maximum 6 need to be scored. Each item will be scored according to Table 5 in this document.	100		
	Subtotal	100		
	Threshold	100		

4.4 Scoring Method

Each item will be assigned a score by the NTCSA evaluation team based upon the tendered response/demonstrated functionality and cross-checked with the supporting documents provided (where applicable). The scoring method is depicted in Table 4 below:

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Table 5: Scoring method for enquiry

Criteria	Score
Fully compliant <ul style="list-style-type: none"> Meet technical requirement(s) AND; Cross-checked with the supporting documents provided (where applicable) AND; No foreseen technical risk(s) in meeting technical requirements 	3
Partially compliant (minor deviation) <ul style="list-style-type: none"> Does not meet all the technical requirement(s) AND/OR; Unacceptable technical risks(s) AND/OR; Unacceptable exceptions AND/OR; Unacceptable conditions. No supporting documents provided. 	1
Non-compliant (major deviation) <ul style="list-style-type: none"> Totally deficient or non-responsive 	0

5. Acceptance

This document has been seen and accepted by:

Name	Designation
Not applicable	Not applicable

6. Revisions

Date	Rev.	Compiler	Remarks
July 2025	2	T Gosai	Detailed the FRM/CH220 unit
April 2024	1	T Gosai	Business requirement

7. Development Team

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

- Krupa Jose
- Zwelandile Mbebe

8. Acknowledgements

Not applicable.

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Appendix A – Technical Schedules A&B

Name of Evaluator : _____

Date: _____

Supplier : _____

TECHNICAL SCHEDULES A & B FOR FIBRE TO X.21 CONVERTER EQUIPMENT					
Schedule A: Purchaser's specifications Schedule B: Guarantees, compliance and technical particulars of equipment offered					
<ul style="list-style-type: none"> When completing the Schedule B and the References section, The Tenderer is required to state clearly, for each clause that requires a statement of compliance, with one of the following options: <ul style="list-style-type: none"> a) Comply – Confirmation of FULL Compliance to all clauses of the applicable section of the Technical Standard. No deviations b) Partially Comply – Confirmation of PARTIAL Compliance and that FULL Compliance is not possible. Deviations taken. c) Do Not Comply - Confirmation of Non-Compliance to ALL requirements in the applicable section if applicable. 					
	Description	Schedule A	Schedule B	Reference s/ Statement (supporting evidence) if required & Deviations	Score
1	Manufacturer	List and provide details			
2	Manufacturer's type reference	List and provide details			
3	FRM220-CH08 Fibre to X.21 Converter				
	a) Comply with clause 3.1a) of this specification	Comply and provide supporting documentation			
	b) Comply with clause 3.1b) of this specification.	Comply and provide supporting documentation			
	c) Comply with clause 3.1c) of this specification.	Comply and provide supporting documentation			
	d) Comply with clause 3.1d) of this specification.	Comply and provide supporting documentation			

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	e) Comply with clause 3.1e) of this specification.	Comply and provide supporting documentation			
	f) Comply with clause 3.1f) of this specification.	Comply and provide supporting documentation			

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Appendix B – Sample Evaluation List

Name of Evaluator : _____

Date: : _____

Supplier : _____

	Description	Compliant/ Part Compliant/ Non - Compliant	Details	Score
1	FRM220-CH08 Fibre to X.21 Converter Link	X	X	X
	a) Does the FRM220-CH08 Fibre to X.21 Converter consists of three components as listed in table 1 in this document.			
	b) Does the FRM220-CH08 Fibre to X.21 Converter match the data sheets provided for the Desktop Evaluations as listed in in section 3b), 3d) and 3f) in this document.			

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