Pre-FAT/Routine	
FAT	

Grid Vision T&D Sdn.Bhd.

Factory Acceptance Test Record
DF1725IED RTU

Project Name	
Contract No.	

Approval				
	Name	**Company**	**Date**	**Signature**
Prepared by:	Muhammad Nor Farhan	Grid Vision T&D	17th December 2024	
Reviewed by:	Lim Yee Chin	Grid Vision T&D	17th December 2024	
Verified by:	Ir. Ts. Ramlah Binti Awang	Tenaga Nasional Berhad		

Change Log

No.	Date	Rev No.	Remark
1	22/12/2022	00	• Initial Release
2	24/2/2024	00	• Revise parameter setting for AI, IEC101.
3	16/5/2024	01	• Separate Test Procedure and Test Record
4	10/9/2024	01	• Update firmware version and date for MCU-1-A and MCU-4-A. • Change Force to 0 setting under AI Card Module.
5	17/12/2024	02	• Add Ecolink LED in accessories list. • Add another firmware check under Processor Functional Test. • Update IEC104 Channel Redundancy Test Procedure. • Combine Physical and Functional result in 1 page. • Add checkbox and signature box in FAT flowchart. • Add tester's competency verification. • Update IOA for I/O Fail. • Add COM-6-A Module. • Add Appendix for I/O Test Setup.

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	CONTRACT NO:	TEST RECORD SHEET	5 of 39
FAT – TEST RECORD REF:	OVERALL TEST RESULT	RECORD SHEET NO.	1 of 1

1.0 Overall Pre-FAT/FAT Result

RTU Serial No.	

PASS ☐
FAIL ☐

REMARKS:

Tested By:
(Signature/Official Stamp)

Witnessed By:
(Signature/Official Stamp)

_____

Tester's
Name:
Date:

_____

TNB QAI's
Name:
Date:

FORM REF	1725IED-FAT-TR-TS		
FORM DESCRIPTION	RTU FAT RECORD - TEST SUMMARY	FORM VERSION	02
PROJECT DETAILS	RTU SERIAL NO:	PRODUCT DETAILS	DF1725IED RTU
	CONTRACT NO:	TEST RECORD SHEET	6 of 39
FAT – TEST RECORD REF:	FAT TEST SUMMARY	RECORD SHEET NO.	1 of 1

2.0 Factory Acceptance Test Summary

No.	Form Description	No. of Record	Result
1	Pre-Requisites		Pass/Fail
2	Declaration		Pass/Fail
3	Accessories		Pass/Fail
4	Physical Inspection		Pass/Fail
5	Parameter Setting		Pass/Fail
6	Functional Test		Pass/Fail
7	Channel Redundancy Test		Pass/Fail

3.0 FAT Log

Day	Time		Test Activity
	Start	End	
1			
2			
3			

4.0 FAT Attendance

Date	Name	Company	Designation	Signature
		Grid Vision T&D	Tester	
		Grid Vision T&D	Tester	
		TNBR/TNBLabs	QAI	

1.0 Approved Drawings

Drawing Title	Drawing No.	Revision	Approved Date	OK
Telecontrol Overview Drawing	GV TNBD 0614 B02 TOD			☐
RTU Configuration Drawing	GV TNBD 0614 B01 RCF			☐
RTU Cubicle Internal Wiring Drawing	GV TNBD 0614 V01 RIW			☐
RTU Cubicle Drawing	GV TNBD 0614 U01 CDW			☐
RTU Parameter List	GV TNBD 0614 T01 PM			☐
RTU Cable Drawing	GV TNBD 0614 T11 RCS			☐

2.0 Bill of Quantity

No.	Module Name	Part Number	Quantity	Firmware Version
1	RTU Subrack	1725IED_SUBRACK 19”		N/A
2	RTU Subrack	1725IED_SUBRACK 2/3 19”		N/A
3	RTU Subrack	1725IED_SUBRACK 1/2 19”		N/A
4	RTU Processor Board	1725IED_MCU-1-A		4.11.024 24 Aug 2024
5	RTU Processor Board	1725IED_MCU-4-A		4.02.008 24 Nov 2023
6	RTU Digital Input Module	1725IED_DI-32-24V		N/A
7	RTU Digital Input Module	1725IED_DI-16-24V-A		N/A
8	RTU Digital Input Module	1725IED_DI-16-110V		N/A
9	RTU Digital Output Module	1725IED_CO-8-A		N/A
10	RTU Digital Output Module	1725IED_CO-16-A		N/A
11	RTU Analog Input Module	1725IED_DCAI-8-A		N/A
12	110/220V Power Supply Board	1725IED_POWER-110/220V		N/A
13	24V Power Supply Board	1725IED_POWER-24V-A		N/A
14	Communication Module	1725IED_COM-6-A		N/A

3.0 SGP Certificate

Item	Serial Number
DF1725IED RTU SGP Certificate	D2023–0510:0014

4.0 Panel IP Certificate

No.	RTU Panel Type	IP Rating	Certificate Number	Applicable
1	Floor Standing – Indoor	IP51	2017EEA0204	☐
2	Floor Standing – Outdoor	IP54	2021EA1541	☐
3	Wall Mounted – Indoor	IP51	2015EEA0091	☐
4	Wall Mounted – Outdoor	IP54	2021EA1540	☐

5.0 Test Equipment Record

No.	Item	Brand	Model	Serial Number
1	Laptop			
2				
3				

6.0 Measuring Equipment Record

No.	Item	Brand	Model	Serial Number	Calibration Date	Calibration Due Date
1	Process Meter	Fluke	787			
2	Measuring Tape					
3	Digimatic Caliper					
4						

7.0 Software Record

No.	Item	Brand	Software Name	Version	OK
1	Diagnostic/Configuration Tool	Dong Fang	DFE Engineering Tool Software	3.02.009	☐
2	IEC101/IEC104/DNP3.0 Master Simulator	ASE	ASE2000 Version 1	1.56	☐

8.0 Pre-FAT Record

Pre-FAT Date	
Pre-FAT Result	Pass/Fail
Remarks/Notes	

9.0 Tester's Competency

No.	Tester's Name	Years of Experience
1		
2		

Tested By:
(Signature/Official Stamp)

Witnessed By:
(Signature/Official Stamp)

_____

Tester's
Name:
Date:

_____

TNB QAI's
Name:
Date:

1.0 Product Declaration

Item	Description	Remarks
1	RTU Model	DF1725IED
2	Communication Protocol	IEC101 ☐Single ☐Redundancy IEC104 ☐Single ☐Redundancy DNP3 ☐Single ☐Redundancy
3	Type	☐Centralized ☐Decentralized
4	Power Supply Input	☐110VDC ☐30VDC ☐24VDC Others:

Tested By:
(Signature/Official Stamp)

Witnessed By:
(Signature/Official Stamp)

_____

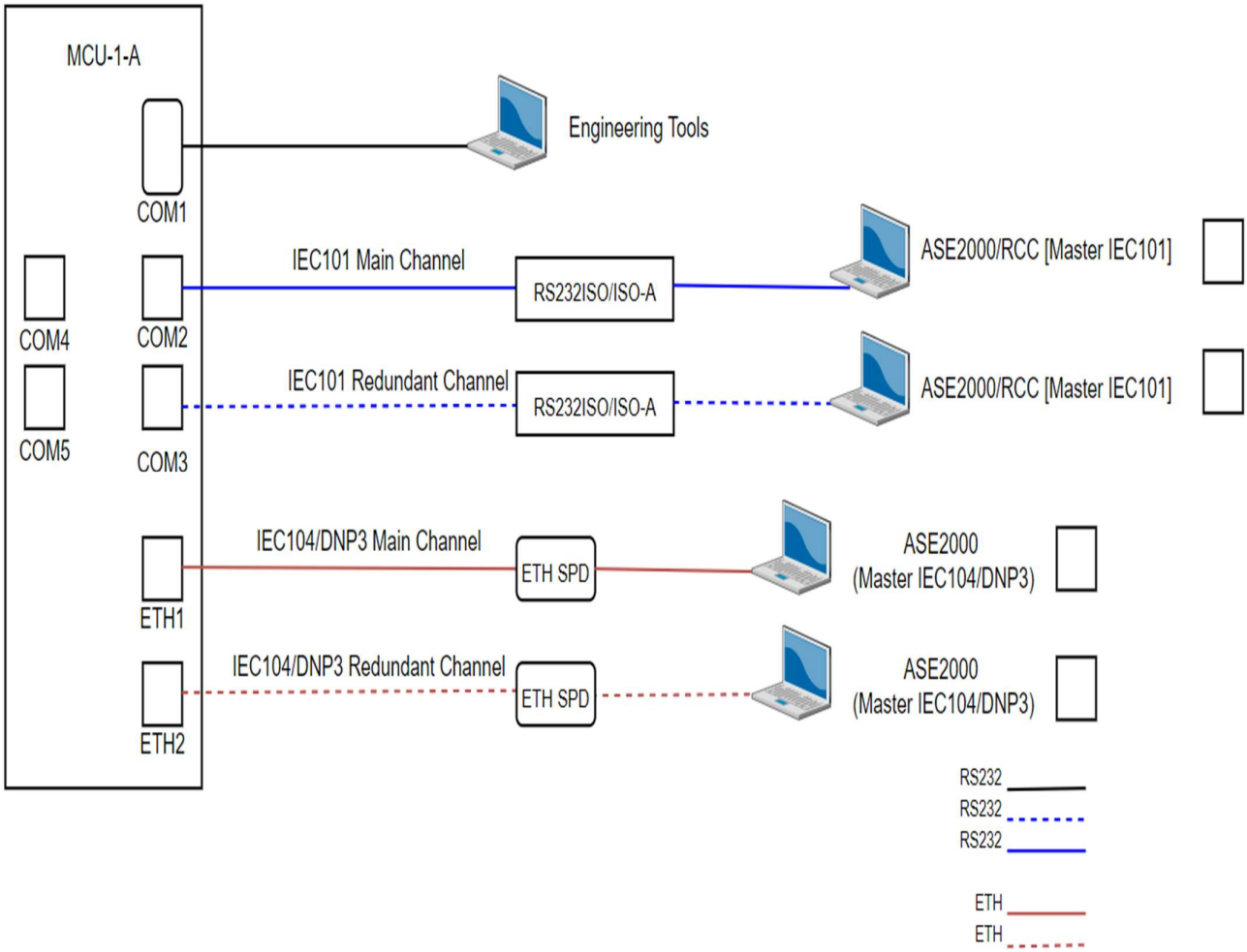
Tester's
Name:
Date:

_____

TNB QAI's
Name:
Date:

2.0 Test Setup

Notes: For I/O Test Setup, please refer Appendix: I/O Test Setup (i) to (iv).



Tested By:
(Signature/Official Stamp)

Witnessed By:
(Signature/Official Stamp)

_____

Tester's
Name:
Date:

_____

TNB QAI's
Name:
Date:

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FORM REF	1725IED-FAT-TR-ACC		
FORM DESCRIPTION	RTU FAT RECORD – ACCESSORIES	FORM VERSION	02
PROJECT DETAILS	RTU SERIAL NO:	PRODUCT DETAILS	DF1725IED RTU
	CONTRACT NO:	TEST RECORD SHEET	12 of 39
FAT – TEST RECORD REF:	ELECTRONIC ACCESSORIES INSPECTION	RECORD SHEET NO.	1 of 1

1.0 Electronic Accessories

Item	Accessories	Brand	Model	Quantity	Datasheet	OK
1	Dummy Breaker	DongFang ☐ IDEC ☐ TE ☐	JHXH-121FF C-2a2b ☐ RR2KP-U ☐ KUL-11D15D ☐		YES/NO	☐
2	Fault Alarm Relay [K2]	IDEC ☐ TE ☐ Shenler ☐ Omron ☐	RJ1S ☐ RT314024 ☐ RFT1CO024 ☐ MK2SP ☐		YES/NO	☐
3	Fault Alarm Relay [K3]	IDEC ☐ TE ☐ Shenler ☐ Omron ☐	RJ1S ☐ RT314024 ☐ RFT1CO024 ☐ MK2SP ☐		YES/NO	☐
4	110VDC Power Supply Unit Surge Protector	DongFang ☐	PLPT-110VDC ☐		YES/NO	☐
5	30VDC Power Supply Unit Surge Protector	DongFang ☐	PLPT-30VDC ☐ PLPT-30V-A ☐		YES/NO	☐
6	UTP Cable Surge Protector	APC ☐ DongFang ☐	PNET1GB ☐ DF-LPT-ETH ☐		YES/NO	☐
7	Modem Splitter	DongFang ☐	DF1745MSN/DC24V ☐		YES/NO	☐
8	Communication Surge Arrestor	DongFang ☐	RS232ISO ☐ RS232ISO-A ☐		YES/NO	☐
9	Lease Line Modem	TAINET ☐	T-336CX ☐		YES/NO	☐
10	Communication Surge Protector	CRITEC ☐	UTB-30SP ☐		YES/NO	☐
11	Fiber Modem	AD-net ☐	AN-FM-RS232 ☐		YES/NO	☐
12	Router Switch	Four-Faith ☐	F-R100 ☐		YES/NO	☐

2.0 RTU Panel Accessories

Item	Accessories	Brand	Model	Quantity	Datasheet	OK
1	MCB DC	Schneider ☐ L&T ☐ Himel ☐	A9F74206 ☐ BB2006DC ☐ HDB9Z632C6 ☐		YES/NO	☐
2	MCB DC (Converter)	Schneider ☐ L&T ☐ Himel ☐	A9F74106 ☐ BB1006DC ☐ HDB3wHN2C6 ☐		YES/NO	☐
3	MCB DI	Schneider ☐ L&T ☐ Himel ☐	A9F74106 ☐ BB1006DC ☐ HDB9Z631C6 ☐		YES/NO	☐
4	MCB CES	Schneider ☐ L&T ☐ Himel ☐	A9F74206 ☐ BB2006DC ☐ HDB9Z632C6 ☐		YES/NO	☐
5	MCB Modem	Schneider ☐ L&T ☐ Himel ☐	A9F74206 ☐ BB2006DC ☐ HDB3wHN2C6 ☐		YES/NO	☐
6	MCB AC (F6)	Schneider ☐ L&T ☐ Himel ☐	A9F74216 ☐ BB20160C ☐ HDB3wHN2C16 ☐		YES/NO	☐
7	MCB AC (F6A)	Schneider ☐ L&T ☐ Himel ☐	A9F74216 ☐ BB20160C ☐ HDB3wHN2C16 ☐		YES/NO	☐
8	MCB Auxiliary Contact	Schneider ☐ L&T ☐ Himel ☐	A9A26924 ☐ BZA11006 ☐ HDB963DF ☐		YES/NO	☐
9	Control Enable Switch	Seiko ☐ K&N ☐ Stilo ☐	ESN-C202X ☐ CA10 ☐ SA2061038CM ☐		YES/NO	☐
10	DC/DC 110/24VDC Converter	Mean Well ☐	SD-100D-24 ☐		YES/NO	☐

FORM REF	1725IED-FAT-TR-ACC		
FORM DESCRIPTION	RTU FAT RECORD – ACCESSORIES	FORM VERSION	02
PROJECT DETAILS	RTU SERIAL NO:	PRODUCT DETAILS	DF1725IED RTU
	CONTRACT NO:	TEST RECORD SHEET	14 of 39
FAT – TEST RECORD REF:	RTU PANEL ACCESSORIES INSPECTION	RECORD SHEET NO.	1 of 1

Item	Accessories	Brand	Model	Quantity	Datasheet	OK
11	Door Switch	Higly ☐ Himel ☐ Plasma ☐	Z15G1307 ☐ HXCMP-1307 ☐ PMS-1307 ☐		YES/NO	☐
12	Buzzer Switch	Higly ☐ Himel ☐ Plasma ☐	Z15G1307 ☐ HXCMP-1307 ☐ PMS-1307 ☐		YES/NO	☐
13	Panel Light	Philips ☐ Lit By Cardi ☐ Ecolink ☐	LED-6500K-E27 ☐		YES/NO	☐
14	Switch Socket Outlet	Schneider ☐ UMS ☐ Himel ☐	KB15-WE-G11 ☐ SP-2913A ☐ HWDA13SS ☐		YES/NO	☐
15	Lamp Indicator DC Supply	ATEC ☐ Shimatec ☐ ATOMS ☐	AD22-22DS ☐ AD22B-22DS ☐ AD117 ☐		YES/NO	☐
16	Lamp Indicator RTU Fault	ATEC ☐ Shimatec ☐ ATOMS ☐	AD22-22DS ☐ AD22B-22DS ☐ AD117 ☐		YES/NO	☐
17	Lamp Indicator Dummy CB Open	ATEC ☐ Shimatec ☐ ATOMS ☐	AD22-22DS ☐ AD22B-22DS ☐ AD117 ☐		YES/NO	☐
18	Lamp Indicator Dummy CB Close	ATEC ☐ Shimatec ☐ ATOMS ☐	AD22-22DS ☐ AD22B-22DS ☐ AD117 ☐		YES/NO	☐
19	Terminal Block (DC Wetting/DO System)	Weidmuller ☐ Phoenix ☐ Contact ☐ Entrelec	WTR2.5 ☐ UT2.5-MT ☐ MA2.5/5.SNB ☐		YES/NO	☐
20	Terminal Block (I/O Plant)	Weidmuller ☐ Phoenix ☐ Contact ☐ Entrelec	WTR2.5 ☐ UT2.5-MT ☐ MA2.5/5.SNB ☐		YES/NO	☐
21	Terminal Block (DC Plant/Input/Comm)	Weidmuller ☐ Phoenix ☐ Contact ☐ Entrelec	WTL6/1/STB ☐ EN ☐ SAKTL 6 STB ☐ URTK/S ☐ M6/8.ST1		YES/NO	☐
22	Terminal Block (AC Circuit)	Weidmuller ☐ Phoenix ☐ Contact ☐ Entrelec	WTL6/1/STB ☐ EN ☐ SAKTL 6 STB ☐ URTK/S ☐ M6/8.ST1		YES/NO	☐

FORM REF	1725IED-FAT-TR-ACC		
FORM DESCRIPTION	RTU FAT RECORD – ACCESSORIES	FORM VERSION	02
PROJECT DETAILS	RTU SERIAL NO:	PRODUCT DETAILS	DF1725IED RTU
	CONTRACT NO:	TEST RECORD SHEET	15 of 39
FAT – TEST RECORD REF:	RTU PANEL ACCESSORIES INSPECTION	RECORD SHEET NO.	1 of 1

Item	Accessories	Brand	Model	Quantity	Datasheet	OK
23	Terminal Block (External Local Alarm – XE)	Weidmuller ☐ Phoenix Contact ☐ Entrelec ☐	WTR2.5 ☐ UT2.5-MT ☐ MA2.5/5.SNB ☐		YES/NO	☐
24	Earthing Bar	GV ☐	Copper ☐		YES/NO	☐
25	Buzzer	XGH ☐ ATOMS ☐	AD22-22SM ☐ AD116-BZ ☐		YES/NO	☐

Tested By:
(Signature/Official Stamp)

_____

Tester's
Name:
Date:

Witnessed By:
(Signature/Official Stamp)

_____

TNB QAI's
Name:
Date:

1.0 Panel Information

No.	Description	Record
1	RTU Serial No.	

2.0 Physical and Quality Inspection

No.	Inspection	Measurement (mm)	Manufacturer Tolerance	OK	NO
1	Panel Height		±5%	☐	☐
2	Panel Width		±5%	☐	☐
3	Panel Depth		±5%	☐	☐

No	Inspection	OK	NO
1	The panel is free from defect e.g. scratches, deformities, corrosion, broken.	☐	☐
2	The wirings are neat, tidy, proper, and accessible.	☐	☐
3	The wire marker and ferrules are available, proper, and correct.	☐	☐
4	The wire marker has source and destination stated.	☐	☐
5	The terminal block arrangement is proper and tidy.	☐	☐
6	All LED indicators are correct as per approved drawing.	☐	☐

Tested By:
(Signature/Official Stamp)

Witnessed By:
(Signature/Official Stamp)

_____ _____

Tester's
Name:
Date:

TNB QAI's
Name:
Date:

1.0 Subrack Information

Subrack No.	Description	Record
	Part Number	SUBRACK 19" ☐ SUBRACK 2/3 19" ☐ SUBRACK 1/2 19" ☐
	Serial Number	
	Part Number	SUBRACK 19" ☐ SUBRACK 2/3 19" ☐ SUBRACK 1/2 19" ☐
	Serial Number	
	Part Number	SUBRACK 19" ☐ SUBRACK 2/3 19" ☐ SUBRACK 1/2 19" ☐
	Serial Number	
	Part Number	SUBRACK 19" ☐ SUBRACK 2/3 19" ☐ SUBRACK 1/2 19" ☐
	Serial Number	
	Part Number	SUBRACK 19" ☐ SUBRACK 2/3 19" ☐ SUBRACK 1/2 19" ☐
	Serial Number	
	Part Number	SUBRACK 19" ☐ SUBRACK 2/3 19" ☐ SUBRACK 1/2 19" ☐
	Serial Number	
	Part Number	SUBRACK 19" ☐ SUBRACK 2/3 19" ☐ SUBRACK 1/2 19" ☐
	Serial Number	

2.0 Physical and Quality Inspection

Subrack No.	Inspection	OK	NO
	The subrack is free from defect e.g. scratches, deformities, corrosion, broken.	☐	☐
	The subrack is free from defect e.g. scratches, deformities, corrosion, broken	☐	☐
	The subrack is free from defect e.g. scratches, deformities, corrosion, broken	☐	☐
	The subrack is free from defect e.g. scratches, deformities, corrosion, broken	☐	☐
	The subrack is free from defect e.g. scratches, deformities, corrosion, broken	☐	☐
	The subrack is free from defect e.g. scratches, deformities, corrosion, broken	☐	☐
	The subrack is free from defect e.g. scratches, deformities, corrosion, broken	☐	☐

Tested By:
(Signature/Official Stamp)

Witnessed By:
(Signature/Official Stamp)

_____ _____

Tester's
Name:
Date:

TNB QAI's
Name:
Date:

1.0 Physical and Quality Inspection

Power Supply No.	Part Number	Subrack No.	Slot No.	Serial Number
	POWER-24V-A ☐ POWER 110-220V ☐			

No.	Quality Inspection	OK	NO
1	The module is free from defect e.g. scratches, deformities, corrosion, broken.	☐	☐

2.0 Functional Test – Power Supply

Input Voltage	Inspection	OK	NO
_____ VDC	Power Supply Module is in good condition. Both 5V and 3.3V LED light up.	☐	☐

Tested By:
(Signature/Official Stamp)

_____

Tester's
Name:
Date:

Witnessed By:
(Signature/Official Stamp)

_____

TNB QAI's
Name:
Date:

1.0 Physical and Quality Inspection

Processor No.	Part Number	Subrack No.	Slot No.	Serial Number
	MCU-1-A ☐ MCU-4-A ☐			

No.	Quality Inspection	OK	NO
1	The module is free from defect e.g. scratches, deformities, corrosion, broken.	☐	☐
2	The jumper is set as per approved drawing.	☐	☐

2.0 Functional Test - Processor

No.	Inspection	OK	NO
1	The PWR LED is permanently lights up.	☐	☐
2	The RUN LED is blinking normally.	☐	☐
3	Processor can be connected to maintenance tools.	☐	☐
4	Firmware Version is **4.11.024 [24 Aug 2024]** for MCU-1-A or **4.02.008 [24 Nov 2023]** for MCU-4-A.	☐	☐

Tested By:
(Signature/Official Stamp)

Witnessed By:
(Signature/Official Stamp)

_____ _____

Tester's
Name:
Date:

TNB QAI's
Name:
Date:

3.0 IEC101 Initialization

No.	Inspection	OK	NO
1	Send **Link Status Request** from ASE2000 to RTU. RTU should reply with **Status of Link response**.	☐	☐
2	Send **Reset Link Request** from ASE2000 to RTU. RTU should reply with **Ack/Fixed response**.	☐	☐
3	Send a **Delay Acquisition Request** from ASE2000 to RTU. RTU should reply with **Delay Acquisition Response**.	☐	☐
4	Send a **Clock Synchronization Request** from ASE2000 to RTU. RTU should reply with **Clock Synchronization Response**.	☐	☐
5	Send a **Broadcast Clock Synchronization Request** from ASE2000 to RTU using CASDU = 65535 and RTU should reply with **Clock Synchronization Response**.	☐	☐
6	Send an **Interrogation Request** from ASE2000 to RTU. RTU shall report all signals mapped to Master (without time tag).	☐	☐

4.0 IEC104 Initialization

No.	Inspection	OK	NO
1	Send **STARTDT ACT** from ASE2000 to RTU. RTU should reply with **STARTDT CON.**	☐	☐
2	Send **TESTFR ACT** from ASE2000 to RTU. RTU should reply with **TESTFR CON**.	☐	☐
3	Send a **Clock Synchronization Request** from ASE2000 to RTU. RTU should reply with **Clock Synchronization Response**.	☐	☐
4	Send a **Broadcast Clock Synchronization Request** from ASE2000 to RTU using CASDU = 65535 and RTU should reply with **Clock Synchronization Response**.	☐	☐
5	Send an **Interrogation Request** from ASE2000 to RTU. RTU shall report all signals mapped to Master (without time tag).	☐	☐

Tested By:
(Signature/Official Stamp)

Witnessed By:
(Signature/Official Stamp)

_____

Tester's
Name:
Date:

_____

TNB QAI's
Name:
Date:

5.0 DNP3.0 Initialization

No.	Inspection	OK	NO
1	Send **Reset Link Request** from ASE2000 to RTU. RTU should reply with **Ack Response.**	☐	☐
2	Send **Link Status Request** from ASE2000 to RTU. RTU should reply with **Status of Link Response**.	☐	☐
3	Send a **Delay Measurement Request** from ASE2000 to RTU. RTU should reply with **Delay Measurement Response**.	☐	☐
4	Send a **Write Date & Time Request** from ASE2000 to RTU. RTU should reply with **Write Date & Time Response**.	☐	☐
5	Send a **Class 0 Data Request** from ASE2000 to RTU. RTU shall report all signals mapped to Master.	☐	☐
6	Send **Enable Unsolicited Request** from ASE2000 to RTU. RTU should reply with **Enable Unsolicited Response**.	☐	☐

Tested By:
(Signature/Official Stamp)

Witnessed By:
(Signature/Official Stamp)

_____ _____

Tester's
Name:
Date:

TNB QAI's
Name:
Date:

FORM REF	1725IED-FAT-TR-PICOM		
FORM DESCRIPTION	RTU FAT RECORD – INSPECTION	FORM VERSION	02
PROJECT DETAILS	RTU SERIAL NO:	PRODUCT DETAILS	DF1725IED RTU
	CONTRACT NO:	TEST RECORD SHEET	22 of 39
FAT – TEST RECORD REF:	INSPECTION – COM-6-A	RECORD SHEET NO.	of

1.0 Physical and Quality Inspection

COM-6-A No.	Part Number	Subrack No.	Slot No.	Serial Number
	COM-6-A			

No.	Quality Inspection	OK	NO
1	The module is free from defect e.g. scratches, deformities, corrosion, broken.	☐	☐
2	The jumper is set as per approved drawing.	☐	☐

2.0 Functional Test – COM-6-A

No.	Inspection	OK	NO
1	The LED lights up based on which port we configured.	☐	☐
2	The Tx and Rx for the used port is blinking.	☐	☐

Tested By:
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Witnessed By:
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1.0 Physical and Quality Inspection

DI No.	Part Number	Subrack No.	Slot No.	Serial Number
	DI-16-24V-A ☐ DI-32-24V ☐			

No.	Quality Inspection	OK	NO
1	The module is free from defect e.g. scratches, deformities, corrosion, broken.	☐	☐
2	The jumper is set as per approved drawing.	☐	☐

2.0 Functional Test – Digital Input Module

No.	Double Bit [1/2] / Single Bit [0/1]		IOA/Index IEC101	IOA/Index IEC104	IOA/Index DNP3	No.	Double Bit [1/2] / Single Bit [0/1]		IOA IEC101	IOA IEC104	IOA DNP3
1						17					
2						18					
3						19					
4						20					
5						21					
6						22					
7						23					
8						24					
9						25					
10						26					
11						27					
12						28					
13						29					
14						30					
15						31					
16						32					

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1.0 Physical and Quality Inspection

DO No.	Part Number	Subrack No.	Slot No.	Serial Number
	CO-8-A ☐ CO-16-A ☐			

No.	Quality Inspection	OK	NO
1	The module is free from defect e.g. scratches, deformities, corrosion, broken.	☐	☐
2	The jumper is set as per approved drawing.	☐	☐

2.0 Functional Test – Digital Output Module

No.	Double Command [1/2] / Single Command [1]		IOA/Index IEC101	IOA/Index IEC104	IOA/Index DNP3
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

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3.0 Dummy Breaker and CES Functional Test

No.	Inspection	OK	NO
1	**During CES ON:** Dummy Breaker LED turns GREEN when Dummy CB Open command is sent.	☐	☐
2	**During CES ON:** Dummy Breaker LED turns RED when Dummy CB Close command is sent.	☐	☐
3	**During CES OFF:** Dummy Breaker LED remain unchanged when Dummy CB Open command is sent.	☐	☐
4	**During CES OFF:** Dummy Breaker LED remain unchanged when Dummy CB Close command is sent.	☐	☐

4.0 Buzzer Test

No.	Inspection	OK	NO
1	**During CES ON:** Close the Panel Door. No Buzzer should be triggered.	☐	☐
2	**During CES OFF:** Close the Panel Door. Buzzer should be triggered.	☐	☐

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1.0 Physical and Quality Inspection

AI No.	Part Number	Subrack No.	Slot No.	Serial Number
	DCAI-8-A			

No.	Quality Inspection	OK	NO
1	The module is free from defect e.g. scratches, deformities, corrosion, broken.	☐	☐
2	The jumper is set as per approved drawing.	☐	☐

2.0 Functional Test – Analog Input Module

Notes: Please write the report value reading in the Result box.

Point No.	Test							IOA/Index		
	Current	0mA	4mA	8mA	12mA	16mA	20mA			
	Raw	-2490 – -2510	-10 – 10	2490 – 2510	4990 – 5010	7940 – 7510	9990 – 10010			
	Report	-8158 – -8225	-33 – 33	8158 – 8225	16350 – 16416	24542 – 24608	32734 – 32799	IEC101	IEC104	DNP3
1	Result									
2										
3										
4										
5										
6										
7										
8										

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1.0 Physical and Quality Inspection

AO No.	Part Number	Subrack No.	Slot No.	Serial Number
	AO-2			

No.	Quality Inspection	OK	NO
1	The module is free from defect e.g. scratches, deformities, corrosion, broken.	☐	☐
2	The jumper is set as per approved drawing.	☐	☐

2.0 Functional Test – Analog Output Module

Point No.	Test					IOA		
	4mA	8mA	12mA	16mA	20mA	IEC101	IEC104	DNP3
1								
2								

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FORM REF	1725IED-FAT-TR-PWR		
FORM DESCRIPTION	RTU FAT RECORD – RTU POWER UP	FORM VERSION	02
PROJECT DETAILS	RTU SERIAL NO:	PRODUCT DETAILS	DF1725IED RTU
	CONTRACT NO:	TEST RECORD SHEET	28 of 39
FAT – TEST RECORD REF:	RTU POWER UP	RECORD SHEET NO.	of

1.0 RTU Power Up

No.	Test Parameter	Actual Reading	OK	NO
1	Panel Input Voltage (DC) = 110/48/30/24 Vdc		☐	☐
2	Panel Input Voltage (AC) = 240 Vac		☐	☐

No.	Inspection	OK	NO
1	The DC Lamp indication is 'ON' with GREEN LED.	☐	☐
2	The Alarm Lamp indication is 'ON' with RED LED.	☐	☐
3	The Dummy Breaker LED is 'OPEN = GREEN' or 'CLOSE = RED'.	☐	☐
4	The panel light is 'ON' when door panel is opened. Panel light is 'OFF' when Door Switch is pressed.	☐	☐
5	The 3 Pin 13A Socket is functional and can be used.	☐	☐

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1.0 Processor Parameter Setting

1.1 MCU-1-A

No	Parameter	Standard Setting	OK	NO
1	Time Zone	UTC +08:00	☐	☐
2	Employ NVRAM	YES	☐	☐
3	Time delay (s)	20 seconds	☐	☐
4	ClockSyn	60 minutes	☐	☐

1.2 MCU-4-A

No	Parameter	Standard Setting	OK	NO
1	Time Zone	UTC +08:00	☐	☐
2	Employ NVRAM	YES	☐	☐
3	Time delay (s)	20 seconds	☐	☐
4	ClockSyn	60 minutes	☐	☐

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2.0 Digital Input Parameter Setting

2.1 Under Card Module

No.	Parameter	Standard Setting		OK	NO
		SPI	DPI		
1	Debounce	10ms	10ms	☐	☐
2	Invert	NO	NO	☐	☐
3	Chatter Time = Tc (ms)	1000	1000	☐	☐
4	Number of Chatter = Nc	5	5	☐	☐
5	Recovery Time = TRcvr	60	60	☐	☐

2.2 Under Logical Module

No.	Parameter	Standard Setting		OK	NO
		SPI	DPI		
1	Transmit SOE	YES	YES	☐	☐
2	Transmit COS	NO	NO	☐	☐
3	Info Code 1	(1)	(3)	☐	☐
4	Info Code 2	(30)	(31)	☐	☐
5	Event Buffer Mode	Uncovered (No Tick)	Uncovered (No Tick)	☐	☐
6	SOE Buffer Size	1000	1000	☐	☐
7	Priority	2	2	☐	☐

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3.0 Digital Output Parameter Setting

3.1 Under Card Module

No.	Parameter	Standard Setting		OK	NO
		Double Command	Single Command		
1	Reset Time (s)	20	20	☐	☐
2	On Time (long: ms)	3000	3000	☐	☐
3	On Time (short: ms)	3000	3000	☐	☐

3.2 Under Logical Module

No.	Parameter	Standard Setting		OK	NO
		Double Command	Single Command		
1	DO Attribute	Trip & Close	Close	☐	☐
2	Command Format	Double / Rise/Fall	Single	☐	☐
3	SBO	SBO	SBO	☐	☐
4	Priority	2	2	☐	☐

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4.0 Analog Input Parameter Setting

4.1 Under Card Module

No.	Parameter	Standard Setting	OK	NO
1	AI Type	4 – 20mA	☐	☐
2	Main Force to 0	YES	☐	☐
3	Force to 0	75	☐	☐

4.2 Under Logical Module

No.	Parameter	Standard Setting	OK	NO
1	Coe. a	32767	☐	☐
2	Coe. b	10000	☐	☐
3	Coe. c	0	☐	☐
4	AI Multiply Coe	YES	☐	☐
5	AI Event Buffer Size	1000	☐	☐
6	Event Buffer Mode	Uncovered (No Tick)	☐	☐
7	Deadband	100	☐	☐
8	Info Code 1	Disable	☐	☐
9	Info Code 2	(34) / (36)	☐	☐
10	Priority	2	☐	☐

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5.0 Analog Output Parameter Setting

5.1 Under Card Module

No.	Parameter	Standard Setting	OK	NO
1	AO Type	4 – 20mA	☐	☐
2	SBO	Direct	☐	☐
3	Full Scale	0x7FFF	☐	☐
4	Reset Time (s)	20	☐	☐

5.2 Under Logical Module

No.	Parameter	Standard Setting	OK	NO
1	Value Format	Normalized / Short floating	☐	☐
2	SBO	SBO	☐	☐
3	Max Value	32767	☐	☐
4	Min Value	0	☐	☐
5	Priority	2	☐	☐

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6.0 IEC101 Parameter Setting

No.	Parameter	Standard Setting	OK	NO
1	Main Port	COM2	☐	☐
2	Backup/Standby Port	COM3	☐	☐
3	Protocol Name/No.	292. Slave_IEC101Sec	☐	☐
4	Standby Mode	One Working Another Spare	☐	☐
5	R&T Under Standby Machine	Neither Transmit nor Receive	☐	☐
6	Breaking Time (ms)	20000	☐	☐
7	Serial Type	RS232	☐	☐
8	Baudrate	9600	☐	☐
9	Data Bit	8	☐	☐
10	Stop Bit	1	☐	☐
11	Parity	Even	☐	☐
12	Link Address Size	2 octets	☐	☐
13	Cause of Transmission Size	1 octet	☐	☐
14	Common Address Size	2 octets	☐	☐
15	IOA Size	2 octets	☐	☐
16	Alarm Time (s)	25	☐	☐
17	Link Transmission Procedure	Unbalanced	☐	☐
18	User ID	User_TNBD	☐	☐

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7.0 IEC104 Parameter Setting

No.	Parameter	Standard Setting	OK	NO
1	Main Port	EthernetA, Link2	☐	☐
2	Backup/Standby Port	EthernetB, Link2	☐	☐
3	Protocol Name/No.	114. Slave_IEC104Sec	☐	☐
4	Standby Mode	Both Have Task	☐	☐
5	Work Mode	TCP Server	☐	☐
6	Port Address	2404	☐	☐
7	Cause of Transmission Size	2 octets	☐	☐
8	Common Address of ASDU Size	2 octets	☐	☐
9	Information Object Address Size	3 octets	☐	☐
10	Control Command Mode	CMD_BOTH	☐	☐
11	Background Scan Time (s)	0	☐	☐
12	T1 period	15 seconds	☐	☐
13	T2 period	10 seconds	☐	☐
14	T3 period	20 seconds	☐	☐
15	K	12	☐	☐
16	W	8	☐	☐

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8.0 DNP3.0 Parameter Setting

No.	Parameter	Standard Setting	OK	NO
1	Main Port	EthernetA, Link 5	☐	☐
2	Backup/Standby Port	EthernetB, Link 3	☐	☐
3	Protocol Name/No.	68. Slave_DNP	☐	☐
4	Standby Mode	BothHaveTask	☐	☐
5	R&T Under Standby Machine	Receive Only	☐	☐
6	Port Address	20000	☐	☐
7	Address 1 = Source Address	1	☐	☐
8	Address 2 = Destination Address	5	☐	☐
9	Sync Time Mode	Enable	☐	☐
10	Selfcheck	YES	☐	☐

Tested By:
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Witnessed By:
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FORM REF	1725IED-FAT-TR-FTVA		
FORM DESCRIPTION	RTU FAT RECORD – VIRTUAL ALARM	FORM VERSION	02
PROJECT DETAILS	RTU SERIAL NO:	PRODUCT DETAILS	DF1725IED RTU
	CONTRACT NO:	TEST RECORD SHEET	37 of 39
FAT – TEST RECORD REF:	FUNCTIONAL TEST – VIRTUAL ALARM	RECORD SHEET NO.	1 of 1

1.0 Virtual Alarm Test

Virtual Alarm	IOA/Index		
	IEC101	IEC104	DNP3
SOE Buffer Full	950 ☐	950 ☐	950 ☐
Time Sync Alarm	951 ☐	951 ☐	951 ☐
RTU Health/Comm Fail	953 ☐	953 ☐	953 ☐
DI Module Fail	☐	☐	☐
DO Module Fail	☐	☐	☐
AI Module Fail	☐	☐	☐
AO Module Fail	☐	☐	☐

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FORM REF	1725IED-FAT-TR-FTRT		
FORM DESCRIPTION	RTU FAT RECORD – REDUNDANCY TEST	FORM VERSION	02
PROJECT DETAILS	RTU SERIAL NO:	PRODUCT DETAILS	DF1725IED RTU
	CONTRACT NO:	TEST RECORD SHEET	38 of 39
FAT – TEST RECORD REF:	CHANNEL REDUNDANCY TEST	RECORD SHEET NO.	1 of 1

Channel Redundancy Test

1.0 IEC101

No.	Procedure	OK	NO
1	Start by polling IEC101 through Main Channel (COM2).	☐	☐
2	Simulate any Digital Input signal and verify ASE2000 received the signal.	☐	☐
3	Do not stop ASE2000 and move the ASE Serial Cable from COM2 to COM3.	☐	☐
4	IEC101 communication will resume through COM3 after around 20 – 30 seconds.	☐	☐
5	Simulate any Digital Input signal and verify ASE2000 receive the data.	☐	☐

2.0 IEC104

No.	Procedure	OK	NO
1	Start by polling IEC104 through Main Channel (Ethernet1).	☐	☐
2	Simulate any Digital Input signal and verify ASE2000 received the signal.	☐	☐
3	Stop ASE2000 and move the LAN Cable from ETH1 to ETH2.	☐	☐
4	Start polling IEC104 again through ETH2.	☐	☐
5	Simulate any Digital Input point and make sure ASE2000 receive the data.	☐	☐

3.0 DNP3

No.	Procedure	OK	NO
1	Start by polling DNP3 through Main Channel (Ethernet1).	☐	☐
2	Simulate any Digital Input signal and verify ASE2000 received the signal.	☐	☐
3	Stop ASE2000 and move the LAN Cable from ETH1 to ETH2.	☐	☐
4	Start polling DNP3 again through ETH2.	☐	☐
5	Simulate any Digital Input point and make sure ASE2000 receive the data.	☐	☐

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Witnessed By:
(Signature/Official Stamp)

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FORM REF	1725IED-FAT-TR-LA		
FORM DESCRIPTION	RTU FAT RECORD – LIMIT OF AUTHORITY	FORM VERSION	02
PROJECT DETAILS	RTU SERIAL NO:	PRODUCT DETAILS	DF1725IED RTU
	CONTRACT NO:	TEST RECORD SHEET	39 of 39
FAT – TEST RECORD REF:	LIMIT OF AUTHORITY	RECORD SHEET NO.	1 of 1

1.0 Limit of Authority

User	Authority									
	Data Viewing		Control Operation		Edit Configuration		Manage User		Security Setup	
Superadmin	YES	☐	YES	☐	YES	☐	YES	☐	YES	☐
Operator	YES	☐	YES	☐	NO	☐	NO	☐	NO	☐
Engineer	YES	☐	NO	☐	YES	☐	NO	☐	NO	☐
Viewer	YES	☐	NO	☐	NO	☐	NO	☐	NO	☐

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Witnessed By:
(Signature/Official Stamp)

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