

COMMODITY DESCRIPTION

H.S. NO	ITEM NO.	DESCRIPTION	QUANTITY	UNIT
		Electrocardiograph, analysis software	1	system

A. FEATURES :

1. The software that analyzes electrocardiogram images or waveform data using deep learning algorithms to assist in the diagnosis of arrhythmias and provides numerical values for the risk of emergency situations and cardiac dysfunction, thereby assisting doctors in making diagnostic decisions.
2. 11 types of heart rhythms can be assessed (Sinus Rhythm, Atrial Fibrillation, Atrial Flutter, Paroxysmal Supraventricular Tachycardia (PSVT), Atrial Rhythm, Frequent Premature Beats, Pacemaker Rhythm, Pre-Excitation, Ventricular Tachycardia, Second-degree AV Block, Third-degree AV Block).
3. 10 digital biomarker disease risk assessments are available (Critical Condition (risk of shock, cardiac arrest, and respiratory failure within 24 hours), Acute Coronary Syndrome (ACS), Acute Myocardial Infarction (STEMI), Myocardial Injury, and Left Ventricular Dysfunction (LVD). Dysfunction), right ventricular dysfunction (RV Dysfunction), pulmonary edema, pulmonary hypertension, large pericardial effusion (cardiac tamponade), hyperkalemia

B. CONSIST OF :

1. Electrocardiograph, analysis software 1 set
 - Gateway Server
2. Warranty (same as the subscription service contract)
3. Operating manual 1 copy

C. SPECIFICATIONS :

1. Electrocardiograph, analysis software
 - 1) Data input : 12 lead ECG (image or waveform data)
: Information of user input could be verified
 - 2) Presentation of types and probability of arrhythmia
 - Sinus rhythm (tachycardia, bradycardia, arrhythmia, sinoatrial block)
 - Atrial fibrillation (slow ventricular response, regularized fib., preexcitation)
 - Atrial flutter
 - PSVT
 - Atrial rhythm (focal atrial tachycardia, multifocal atrial tachycardia, wandering atrial pacemaker, atrial bradycardia)
 - Frequent premature beats (supraventricular bigeminy/trigeminy, frequent premature ventricular contractions)
 - Electronic pacemaker
 - Pre-excitation (atrial fibrillation with pre-excitation)
 - Ventricular tachycardia (non-sustained ventricular tachycardia)
 - Second-degree block (atrioventricular block-Wenckebach/Mobitz type 2, atrioventricular block(2:1)/high grade)
 - Third-degree block (complete heart block)
 - 3) Presentation of scores and confidence intervals for digital biomarkers (risk of emergency



situations and cardiac dysfunction)

- Critical condition : Risk of shock/respiratory failure/cardiac arrest within 24 hours
- ACS, STEMI, Pulmonary edema, left/right ventricular dysfunction, pulmonary hypertension
- Myocardial injury, Large pericardial effusion (or tamponade)
- Severe hyperkalemia (K 6.0 mEq or more)

4) AUC (minimum)

I. Arrhythmia

- Sinus rhythm: 0.899
- Atrial fibrillation: 0.912
- Atrial flutter : 0.882
- PSVT : 0.886
- Frequent premature beat : 0.827
- Atrial rhythm : 0.815
- Electronic pacemaker : 0.867
- Pre-excitation : 0.746
- Ventricular tachycardia : 0.794
- 2nd degree block : 0.833
- 3rd degree block : 0.860

II. Digital biomarker

- Critical condition : 0.760
- ACS : 0.755
- STEMI : 0.917
- Myocardial injury : 0.786
- Pulmonary edema : 0.827
- Large pericardial effusion : 0.810
- Left ventricular dysfunction : 0.761
- Right ventricular dysfunction : 0.802
- Severe hyperkalemia : 0.850

5) Gateway server

Limited to equipment specifications that have passed the security certification by the KNUH

- Information Security Team
- Type : RACK
- Name : HPE DL20 Gen11 E-2434 3.4GHz 4C 1P 16GB-U 2LFF 290W PS Svr
(E-2434 4core 3.4GHz 1P, 16GB x1, VROC, 290W)
- Processor : Intel Xeon E-2434 3.4GHz 4-core 55W Processor
- Memory : HPE 16GB (1x16GB) Single Rank x8 DDR5-4800 CAS-40-39-39 Unbuffered
Standard Memory
- Network Controller : HPE embedded 1GB 4-port BCM5719 Network Adapter
- Storage Controller : embedded Intel VROC SATA software RAID
- Internal Storage : 2 LFF HDD Bays (Hot Plug)
- Optical Drive Bay : 1; (Optional: DVD-ROM, DVD-RW)
- Management : iLO Management (standard), Intelligent Provisioning (standard)
- Power Supply : HPE DL20 Gen10 290W Platinum Power Supply Kit (2 LFF Only)

D. REMARKS :

1. Installation



- It shall be provided free of charge during the contract period, and installation and operation must be supported at a location designated by KNUH.
- The vendor is solely responsible for all tasks and costs related to the installation, initial setup, and normal operation of the server.

2. Operation and Maintenance Requirements

- Provide PACS integration and technical support free of charge.
- Provide updates and security patches for performance improvement during the contract period.
- Maintain a 24-hour operational failure response system and provide remote or on-site technical support in the event of a failure.

