



Ittiam Systems Pvt Ltd  
 Customer (Licensee): 3GPP SA WG4  
 Quote: IVAS Codec, Float to Fix Conversion  
 Date: 15 August 2023

SI No	Deliverables	Scope of work	Pricing (USD)
1	IVAS codec (Encoder, Decoder and Renderer)	<p>1) Development of fixed point module using ETSI intrinsic model for the existing C model of IVAS codec.            2) Develop a unit test framework with units (module level breakup) defined/agreed upon in coordination with module owners.            3) The wMOPS complexity numbers obtained from the floating point instrumentation would be the reference and on an average, optimal efforts would be put such that the fixed point implementation meets the same performance levels.            4) Fixed-point conversion of EVS modules would be done by referring to/modifying existing fixed-point code.            5) As Ittiam scope of work for this project is fixed point conversion of IVAS codebase and will not involve any algorithm level modification/introduction of new algorithm, the ownership will be with floating point code owner.            6) Ittiam can accommodate bug fix changes, however, the comparison of base code to updated code would be done on a periodic interval and not as and when there is bug fix.            7) Precision criteria to be defined in coordination with stakeholders.            8) Modules where precision criteria cannot be met, sync up with module owners (Stakeholders). Ultimately, acceptance of converted module will be decided through subjective quality validation. Ittiam and module/operation owners would engage in quality validation and establish a feedback mechanism to ensure that necessary quality criteria are met.            9) The conformance streams/criteria shall be shared by module owners.</p> <p><b>Assumptions</b>            1) Customer to share the latest version of ETSI intrinsic.            2) At the point when Float-to-Fix conversion starts, the expectation is that code has stabilized. There would be minimal feature related changes or changes associated with bug fixes is minimal. This is to accommodate bug fixes as part of floating to fixed conversion.</p>	373,333

Terms and Conditions	
1	This quote is valid for 30 days from the date it is presented
2	<p>Subject to Ittiam Licensing Agreement and Ittiam Conditions of sale            Ittiam Conditions of sale:            1. Software warranty: Includes Technical support for a 3-month period over email and telephone covering bug fixes and queries for Ittiam deliverables. Warranty cover is limited to Ittiam IP deliverables and support for its integration; and 'does not' cover full system-level debugging of the licensee's product/system by Ittiam. Licensee is expected to carry out system-level debugging of all issues for problem isolation before reporting any issue in Ittiam deliverables.            2. Pricing does not include any taxes. All local, national, and international taxes and applicable withholding taxes are to be borne by Licensee, except for any taxes on Ittiam's income.            3. Cost of travel and engineering time (if required during development/warranty / Annual Maintenance Contract) is not comprehended in the pricing.</p>
3	Pricing does not include any taxes. All local, national and international taxes and applicable withholding taxes to be borne by Licensee

**Licensee's Responsibility**

- 1 Share the latest ETSI fixed point intrinsic C model
- 2 Share test vectors necessary for testing logical modules/IVAS Code base
- 3 Share available/existing unit test for logical modules
- 4 Provide extra guidance to Ittiam team on modules where the required precision criteria are difficult to meet
- 5 Define conformance criteria for fixed-point implementation

**Delivery Timeline** (Indicative. Can be further aligned based on customer's program timelines):

Milestone	Deliverable/Description	Timeline
	Signing of Agreement	T0
R1	Fixed point C model delivery of Decoder and Renderer	T1=T0 +4months
R2	Fixed point C model delivery of Encoder	T2 = T0 + 6 Months