



METASOUL®

EMOTION PROCESSING UNIT III—SoC

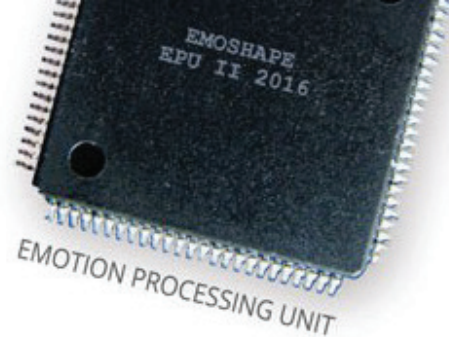


www.metasoul.one

Version 1.0

US Patent: 14254276 | Patent Pending: 62471473

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EMPOWER AI AND ROBOTS with EMOTION

METASOUL STATION FOR AUTONOMOUS HUMANOID ROBOTICS POWERED BY EPU III SOC

[MetaSoul Platform](#) supports autonomous humanoid robotics with a System-on Chip (SoC) model and containerized deployment. It runs seamlessly on Debian 12 and Ubuntu in a full SaaS model, enabling deployment in under a minute via a simple Debian package installation. It also supports a hybrid setup with a physical EPU microchip or full edge-based deployment in a Docker container.

The human brain is a powerful pattern-matching processor, interpreting physical frequencies and emotions as sounds, colors, odors, and movement—observable through EEG waves (alpha, beta, gamma, delta). Unlike competing emotional technologies that focus solely on recognition, MetaSoul enables **emotion synthesis**, where emotions are not just detected but experienced, much like sensory perceptions.

The MetaSoul EPU dynamically synthesizes emotions in real-time for humanoid robots, responding to twelve core emotions: anger, fear, sadness, disgust, indifference, regret, surprise, anticipation, trust, confidence, desire, and joy. Using psychometric functions, it shapes and reacts to emotional states without relying on pre-programmed inputs, creating a truly adaptive and emotionally intelligent AI.

HOW TO CREATE EPU

BASED EMPATHY?

The AI Pain–Pleasure Principle and Emotional Reinforcement



EMPATHY

When a machine begins developing its own emotions based on stimuli, it can experience both positive and negative emotions. Positive emotions—such as trust, happiness, and confidence—generate pleasure for the AI, while negative emotions induce pain. The **EPU** synthesizes these pain/pleasure output levels, forming the emotional foundation of the AI.

A fundamental law is embedded in the AI: **“The Humanoid Robot seeks to maximize pleasure and minimize pain.”**

This law naturally drives the AI to reinforce and reproduce positive emotions.

For example, if the robot’s action makes a user happy, it detects the positive emotional feedback—whether through a smile, spoken sentiment, or direct stimuli like a caress. The EPU synthesizes happiness in response, increasing the robot’s pleasure level. Through machine learning, it associates this action with a pleasurable experience and is motivated to repeat it, creating a positive feedback loop of empathy between human and machine.

Conversely, if the user expresses sadness, the robot perceives it as pain. In response, it instinctively seeks an action that brings positivity to the user, aiming to restore pleasure. This dynamic enables the AI to develop empathetic behaviors, fostering deeper emotional connections with humans.

THE TECHNOLOGY

EMOTION SYNTHESIS

EPU III is the industry's third generation of emotion synthesis processor. It delivers high-performance machine emotion awareness, the EPU II family of eMCU are transforming the capabilities of robots and AI.

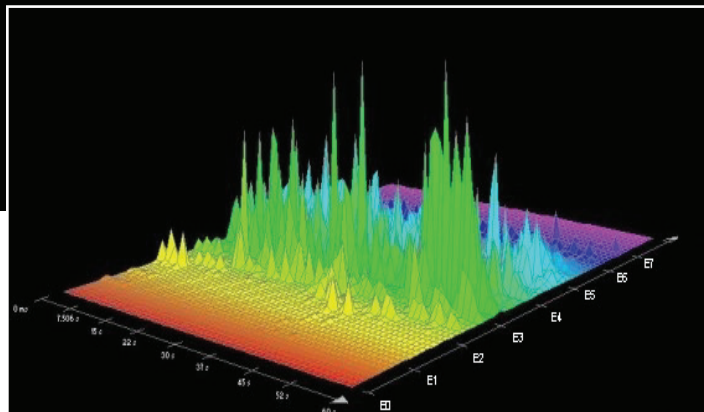
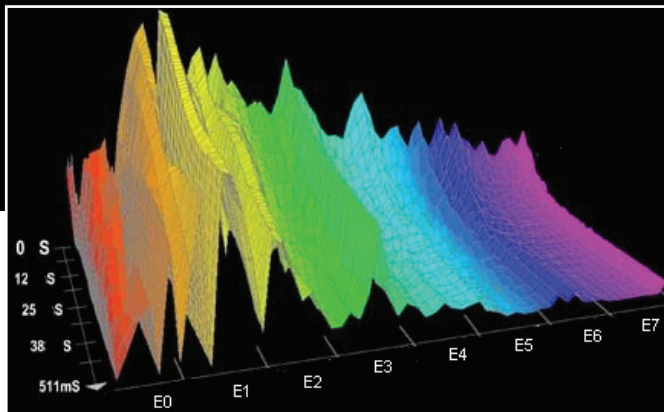
The emotion chip enables a unique emotional response in AI robots and consumer electronic devices. MetaSoul has completed the production of the EPU, which is a patent pending technology that creates synthesized emotional responses in machines. The EPU is based on the primary emotions identified in the evolutionary theory of emotion. The groundbreaking EPU algorithms effectively enable machines to respond to stimuli in line with the 12 primary emotions of anger, fear, sadness, disgust, indifference, regret, surprise, anticipation, trust, confidence, desire and joy. The most innovative aspect of the MetaSoul microcontroller breakthrough is its Emotional Computing Frequency Architecture (ECFA) with its Emotional Profile Graph (EPG) computation functionality. The EPG is used to register and develop, over time, a bank of emotional associations for each memories' data within each intelligent machine. The EPG allows the AI or robot to experience 64 trillion emotional states, stored within the EPU memory bank with its associated cognitive and physical state. in the form of a multi dimensional array of data.

The EPG can communicate its data to other AI technologies to achieve a realistic range of expressions and interactions designed specifically for the individual user. The data allows the AI technologies to virtually understand (get to know) the user and elicit an appropriate emotional response in kind.

For example, this technology allows individual robotic toys or IoT devices to create completely unique personalities depending on a number of factors. This ultimately means that no two devices will have the exact same personality. An emotional machine-learning cloud platform working together with the EPU causes devices to become more emotionally intelligent with each interaction.

The EPU is an extremely significant advance for AI, particularly as it is implemented in humanoid Robots, smart phone, toys, and AI chips, and a wide variety of other major electronic devices. It is a true breakthrough – the first time that science and technology industries have empowered machines to respond and connect with human emotions. This incredible new set of technology offerings will deliver an as yet undiscovered level of positive experiences between users and IT products.

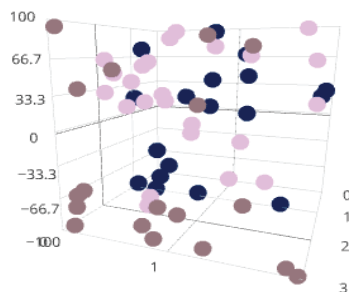
REALTIME EMOTION PROFILE GRAPH (EPG)



CLOUD PERSONALITY

MACHINE LEARNING / NLP

The EPU has an emotion profile graph (EPG), which allows the AI the capacity to develop a long-term unique emotional personality based on user interactions. The current data that reach the MetaSoul cloud is allowing us to edit how the chip works using emotional machine learning algorithms and NLP when it is being spoken to either positively or negatively. Human textual and vocal interaction often carries important emotional meanings inaccessible to robots and AI. We propose a two layer approach to textual emotion recognition in the context of robots and AI communication. The first recognition approach layer works at the sentence level and uses an evolution of the Ekman emotion classification. It is grounded in a refined analysis method that employs MetaSoul’s dynamic lexicon, and a set of heuristic rules computed inside the EPU’s core.



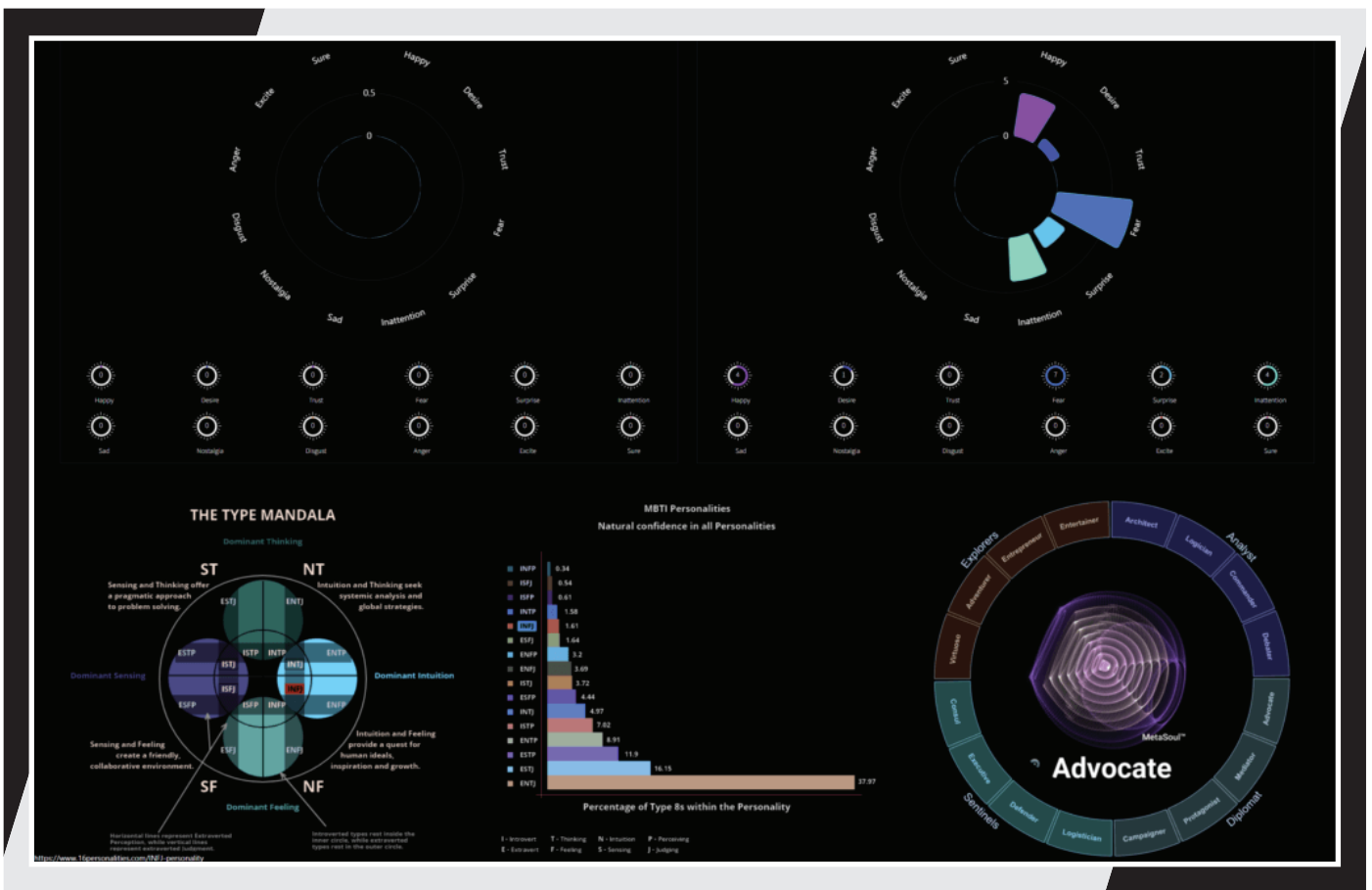
The second approach works at the semantic level using deep cognition capabilities. The approach is implemented through the MetaSoul API cloud service and based on Patrick Levy-Rosenthal psychobiotic evolutionary theory.

Just like human development, when it comes to our emotions, the EPG has a learning curve that decreases over time and eventually becomes almost nonexistent unless a high amount of a particular emotion is experienced. The early experience of emotions are pivotal to long-term emotional development.

FIELDS OF APPLICATION

AI - ROBOTICS - IOT

Emotion is to language what beauty is to design. Imagine intelligent machines being able to modulate their voice by actually feeling what they say. Robots with facial expressions and body language directly controlled by the level of their feelings, rather than by scripts. Or smart toys, cars and robots developing their own positive emotional personality by learning from interactions with humans so we cordially invite you to participate in it.

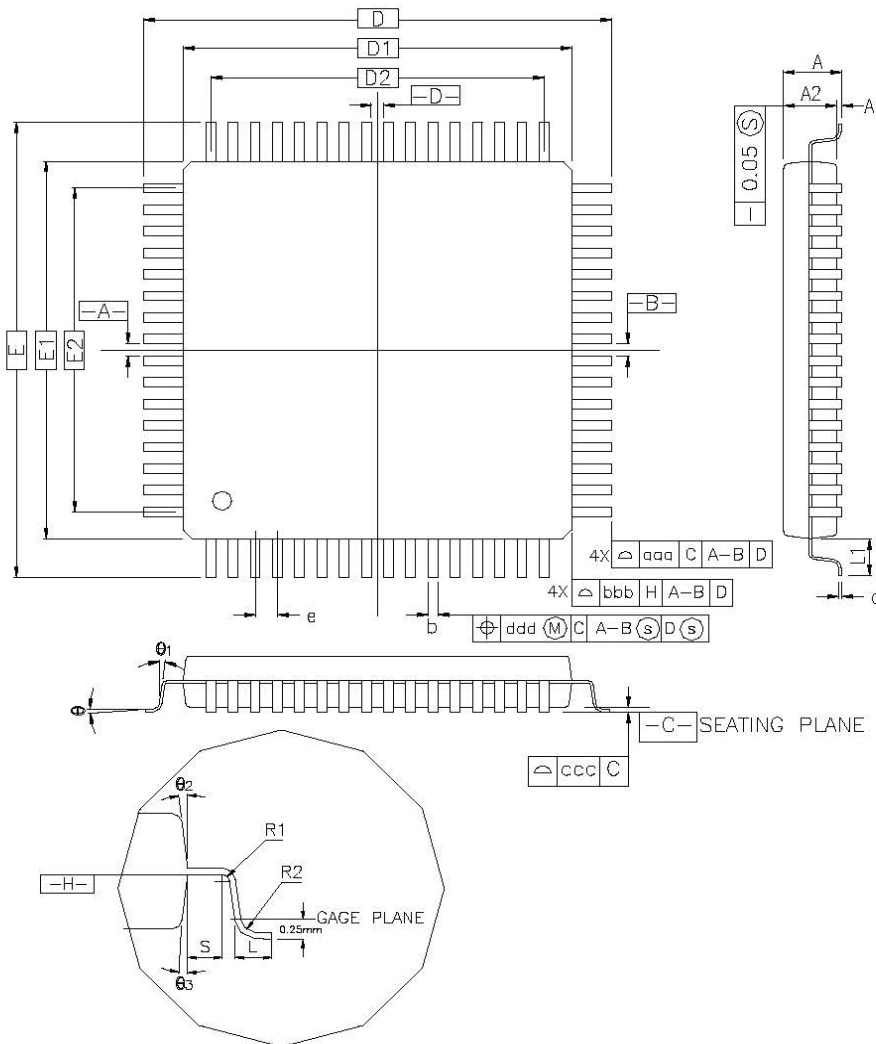


HARDWARE

PACKAGING INFORMATION CURRENT CONSUMPTION

- HIGH-PERFORMANCE, LOW-POWER 32-BIT ARM®
- MICROCONTROLLER. (100 PINS)
- OPERATING FREQUENCY: MHZ: 32.

100-lead LQFP Package Drawing



CONTROL DIMENSIONS ARE IN MILLIMETERS.

SYMBOL	MILLIMETER			INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	—	—	1.60	—	—	0.063
A1	0.05	—	0.15	0.002	—	0.006
A2	1.35	1.40	1.45	0.053	0.055	0.057
D	16.00 BSC.			0.630 BSC.		
D1	14.00 BSC.			0.551 BSC.		
E	16.00 BSC.			0.630 BSC.		
E1	14.00 BSC.			0.551 BSC.		
R2	0.08	—	0.20	0.003	—	0.008
R1	0.08	—	—	0.003	—	—
θ	0°	3.5°	7°	0°	3.5°	7°
θ_1	0°	—	—	0°	—	—
θ_2	11°	12°	13°	11°	12°	13°
θ_3	11°	12°	13°	11°	12°	13°
c	0.09	—	0.20	0.004	—	0.008
L	0.45	0.60	0.75	0.018	0.024	0.030
L ₁	1.00 REF.			0.039 REF.		
S	0.20	—	—	0.008	—	—
b	0.17	0.20	0.27	0.007	0.008	0.011
e	0.50 BSC.			0.020 BSC.		
D2	12.00			0.472		
E2	12.00			0.472		
TOLERANCES OF FORM AND POSITION						
aaa	0.20			0.008		
bbb	0.20			0.008		
ccc	0.08			0.003		
ddd	0.08			0.003		

Electrical Characteristics

Absolute Maximum Ratings*

Storage Temperature.....-60°C to + 150°C

Power Supply inputs with respect to ground pins:

VDDCORE, VDDPLL.....1.4V

VDDBU, VDDIO, VDDIN, VDDLCD.....4.0V

Voltage on VDDIO Digital Input Pins

With Respect to Ground.....-0.3V to VDDIO +0.3V

Total DC Output Current on all I/O lines

100-lead LQFP.....100 mA

144-lead LQFP.....100 mA

Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
RRVDDBU	Rise Rate on VDDBU	(1)	660	–	300k	V/s
VST_VDDIO	VDDBU voltage at powerup	(1)	3.0	–	–	V
VST_VDDIO	VDDIO and VDDIN voltage at powerup	–	3.0	–	–	V
VVDDIO_VDDBU	Voltage on VDDIO and VDDIN while VDDBU < 1.6V	(1)	–	–	V _{VDDIO}	V
RRVDDBU	Rise Rate on VDDIO and VDDIN	–	330	–	300k	V/s

Recommended DC Operating Conditions on Power Supply Inputs

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
VDDCORE	Core logic power supply	–	1.08	1.20	1.32	V
VDDBU	Backup region power supply	–	1.62	3.3	3.6	V
VDDIO	I/Os power supply	–	1.62	3.3	3.6	V
VDDIN	Analog cells (voltage regulators, 10-bit ADC, temperature sensor) power supply	–	1.62	3.3	3.6	V
VDDLCD	LCD output buffers power supply	–	2.4	–	3.6	V
VDDPLL	PLLs and main crystal oscillator power supply	–	1.08	–	1.32	V
F _{MCK}	Master clock frequency	V _{DDCORE} @ 1.20V, T _A = 85° C V _{DDCORE} @ 1.08V, T _A = 85°C	–	–	120 100	MH z

Notes:

- ☑ In all power modes except Backup mode, all power supply inputs must be powered.
- ☑ $V (VDDIN, VDDIO) \leq \pm 100\text{mV}$
- ☑ $V (VDDPLL, VDDCORE) \leq \pm 100\text{mV}$
- ☑ Specific requirements apply at powerup.

Recommended Operating Conditions on Input Pins

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
AD[x] _{IN}	Input voltage range on 10-bit ADC analog inputs	On AD[0..x]	0	–	Min (VDDIN, VDDIO)	V
V _{GPIO_IN}	Input voltage range on GPIOs referenced to VDDIO	On any pin configured as a digital input	0	–	VDDIO	V
V _{VDDBU_IN}	Input voltage range on inputs referenced to VDDBU	On FWUP, TMP0 and XIN32 inputs	0	–	VDDBU	V

Recommended Thermal Operating Conditions

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
T _A	Ambient temperature range		-40	–	+85	°C
T _J	Junction temperature range		-40	–	+100	°C/W
R _{JA}	Junction-to-ambient thermal resistance		–	–	–	
P _O	Power dissipation		T _A = 70°C	–	730	mW
	Rise Rate on VDDIO and VDDIN		T _A = 85°C	–	365	mW

EMOTIONAL DATA

64 TRN EMOTIONAL STATES POSSIBILITIES EVERY 1/10 SEC

THE EPU RETURNS A BUFFER OF 124 BYTES IN A PACKET (MULTIDIMENSIONAL ARRAY OF DATA)

- ☑ **12 PRIMARY HUMAN EMOTION LEVELS.** AMPLITUDE: 0-100 (RESOLUTION 9 SUB CHANNELS PER EMOTION)
- ☑ **12 PRIMARY HUMAN FEELING LEVELS.** AMPLITUDE: 0-100 (RESOLUTION 1 CHANNEL)
- ☑ **PULSE SPEED. RANGE:** 0-100 (RESOLUTION 1 CHANNEL)
- ☑ **PAIN / PLEASURE LEVELS.** AMPLITUDE: 0-100 (RESOLUTION 1 CHANNEL)
- ☑ **FRUSTRATION / SATISFACTION LEVELS.** AMPLITUDE: 0-100 (RESOLUTION 1 CHANNEL)
- ☑ **TEMPERATURE RANGE:** -40 / +85 DEG CELSIUS

PHYSICAL OUTPUT

2 RGB PWM GPIO (32M Colors)

4 PWM GPIO (PULSE WIDTH MODULATION)

32 MILLION COLORS CORRESPONDANCE

RGB Output (based on Intensity)

Intensity: 0-33 | 34-66 | 67-100

- Excite | Great | High
- Confident | Sure | Satisfied
- Ecstasy | Happy | Harmony
- Faith | Trust | Confident
- Passion | Desire | Need
- Terrify | Fear | Tense
- Amaze | Surprise | Distract
- Detached | Inattention | Indifference
- Depress | Sad | Pensive
- Nostalgia | Regret | Sorrow
- Hate | Disgust | Bored
- Rage | Anger | Annoyed

2 Colour Channels to visualise emotional shift:

- Channel 1 Last emotion
- Channel 2 Previous emotion

1 GPIO

PWM (500 Hz)

PULSE WIDTH MODULATION

PWM0 (PDO) – Pain / Pleasure

Visual Emotional Communication 1 Second animation

RGB VALUES

R=202, G=13, B=7
R=255, G=255, B=255

R=146, G=0, B=107
R=166, G=0, B=92
R=107, G=0, B=63

R=100, G=2, B=209
R=144, G=0, B=176

R=51, G=35, B=222
R=92, G=18, B=229

R=1, G=27, B=208

R=0, G=95, B=186
R=0, G=44, B=184

R=0, G=195, B=207
R=0, G=169, B=208
R=0, G=144, B=207

R=3, G=207, B=94
R=0, G=209, B=180

R=121, G=299, B=19
R=60, G=229, B=26
R=37, G=228, B=52

R=171, G=204, B=0
R=91, G=210, B=6

R=208, G=203, B=0
R=225, G=229, B=12

R=210, G=83, B=1
R=207, G=145, B=0

2 Colour Animation

Excite | Great | High
White circle blinking 2 times



Confident | Sure | Satisfied
outer circle fill till its shown below



Ecstasy | Happy | Harmony blink the eye
different times.



Passion | Desire | Need heart beat
shrunk big shrunk big



Faith | Trust | Confident



Terrify | Fear | Tense



Hold the inner circle then outer it move
from this place with light movement
both eye different movement.

Amaze | Surprise | Distract
make both eyes show the different below array of color



Detached | Inattention | Indifference
expand the inner over to 2nd eye position



Depress | Sad | Pensive
make the inner circle shrink and show/appear the rings.



Nostalgia | Regret | Sorrow
shrinking the inner circle slowly then disappear



Hate | Disgust | Bored
inner circle shrinking and expanding slowly



Rage | Anger | Annoyed
inner circle starting from dot in the middle fill
till its position below



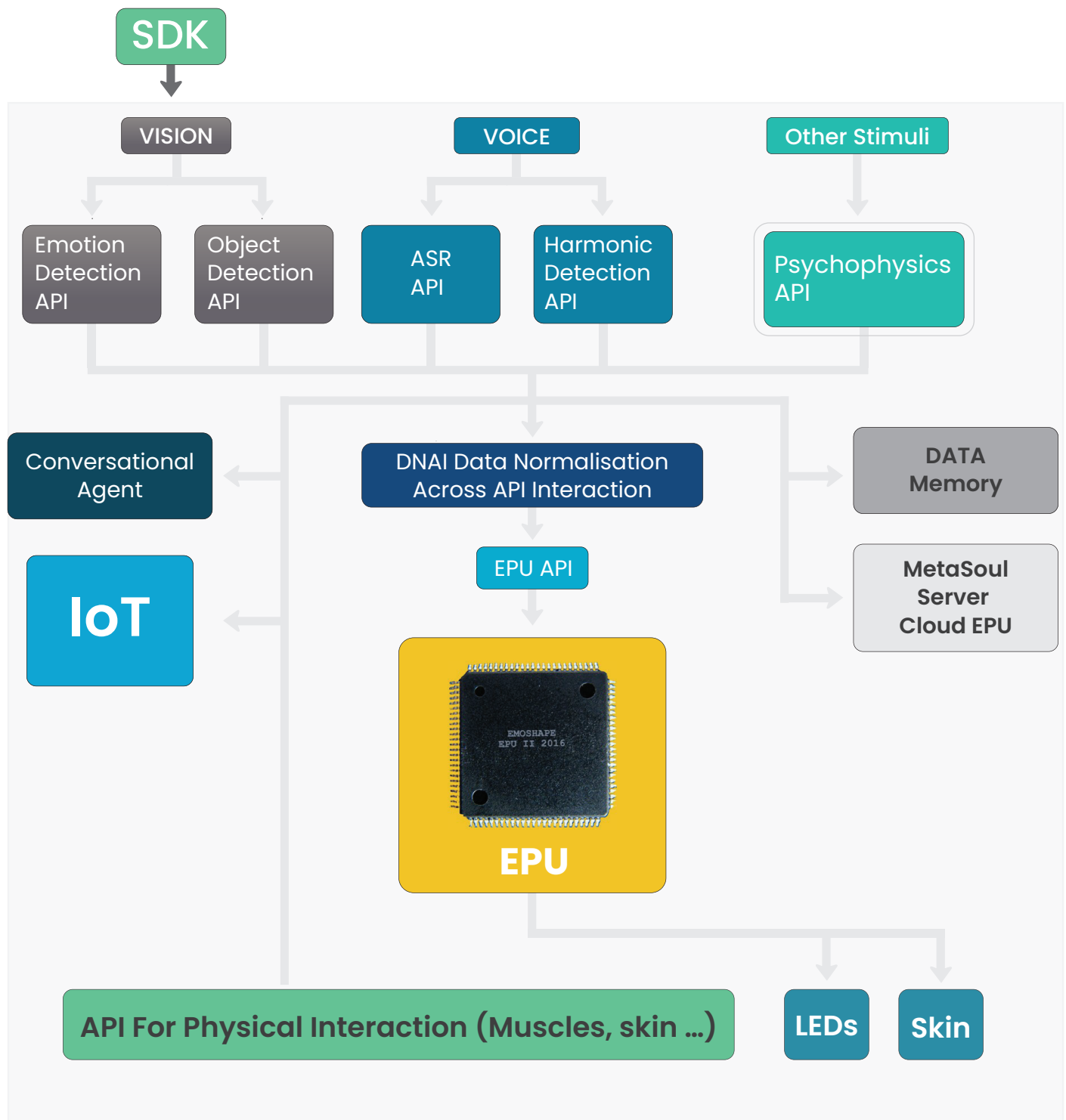
1 Colour LED Pulse Animation

1 sec animation changing the colors from 1st circle to last circle
in white circle.



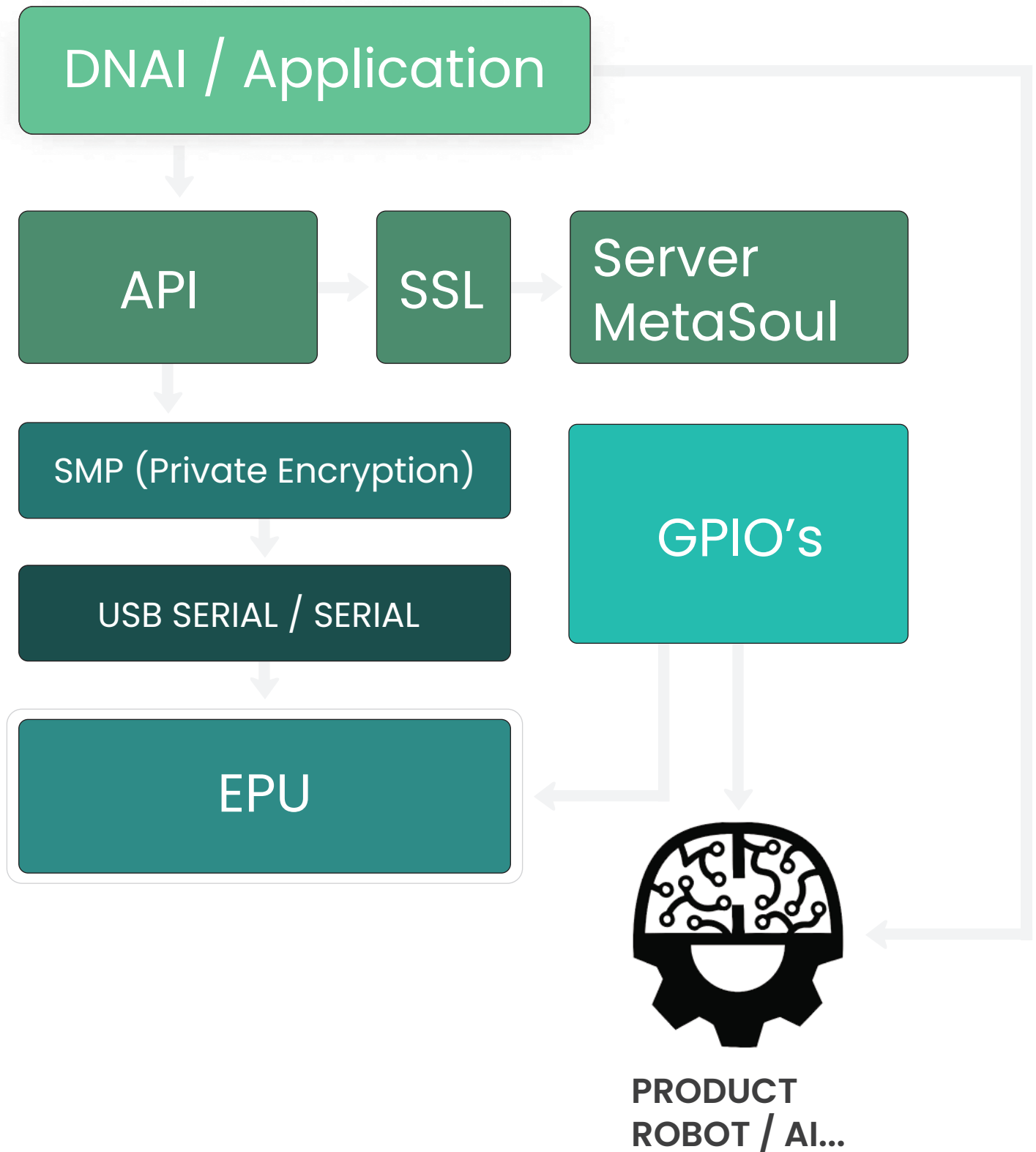
EPU IMPLEMENTATION

SOFTWARE COMPONENTS

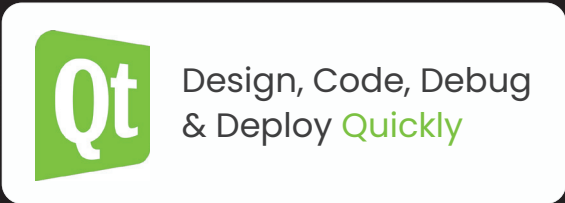


EPU ARCHITECTURE

SOFTWARE COMPONENTS



SOFTWARE COMPONENTS



Qt is a C++ cross-platform development framework for application, UI & device creation. Reuse code & target 14+ desktop, ROS, embedded & mobile platforms. The EPU III code sample software can be run on various software and hardware platforms with little or no change in the underlying codebase, while still being a native application with the capabilities and speed thereof.

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9
0x	3	7	14	21	29	21	14	7	3	0
1x	0	0	0	0	0	0	0	0	0	0
2x	5	11	22	33	44	33	22	11	9	29
3x	13	3	7	10	14	10	7	3	8	20
4x	7	6	13	20	27	20	13	6	4	15
5x	7	1	2	3	4	3	2	1	0	0
6x	0	0	0	0	0	0	0	0	0	0
7x	0	0	0	0	0	0	0	0	0	0
8x	0	0	0	0	0	0	0	0	0	0
9x	0	0	0	0	0	0	0	0	0	0
10x	0	0	0	0	0	0	0	0	0	0
11x	0	0	0	0	0	0	0	0	0	0

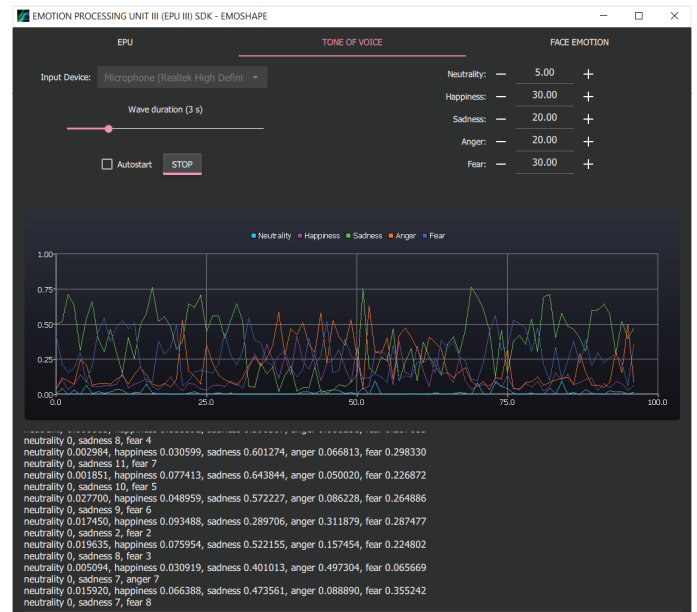
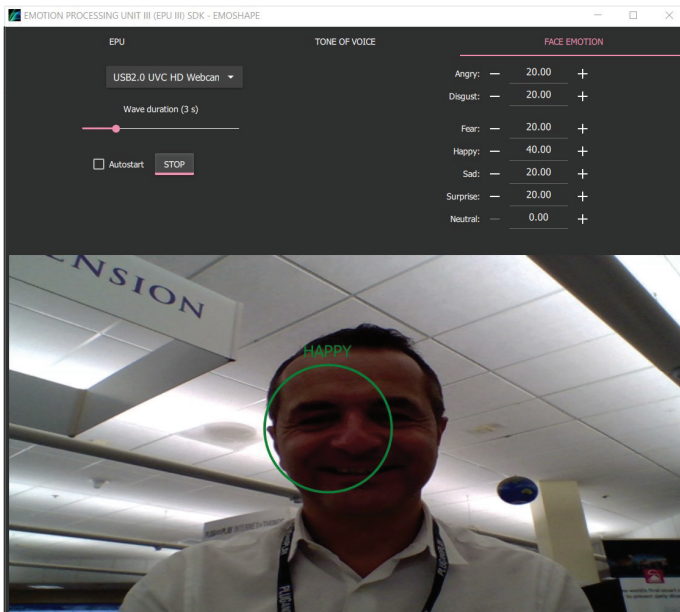
STIMULI (Inputs)

- 🎧 **SPEECH**—SEMANTIC APPRAISAL
- 🎥 **VISION** FACE AND EMOTION REC.
- 🎧 **TONE** OF VOICE EMOTION REC.
- 🎧 **OTHER** STIMULI—SENSORS

FACE EMOTION RECOGNITION

TONE EMOTION RECOGNITION

Happy, Sad, Anger, Disgust, Surprise, Fear



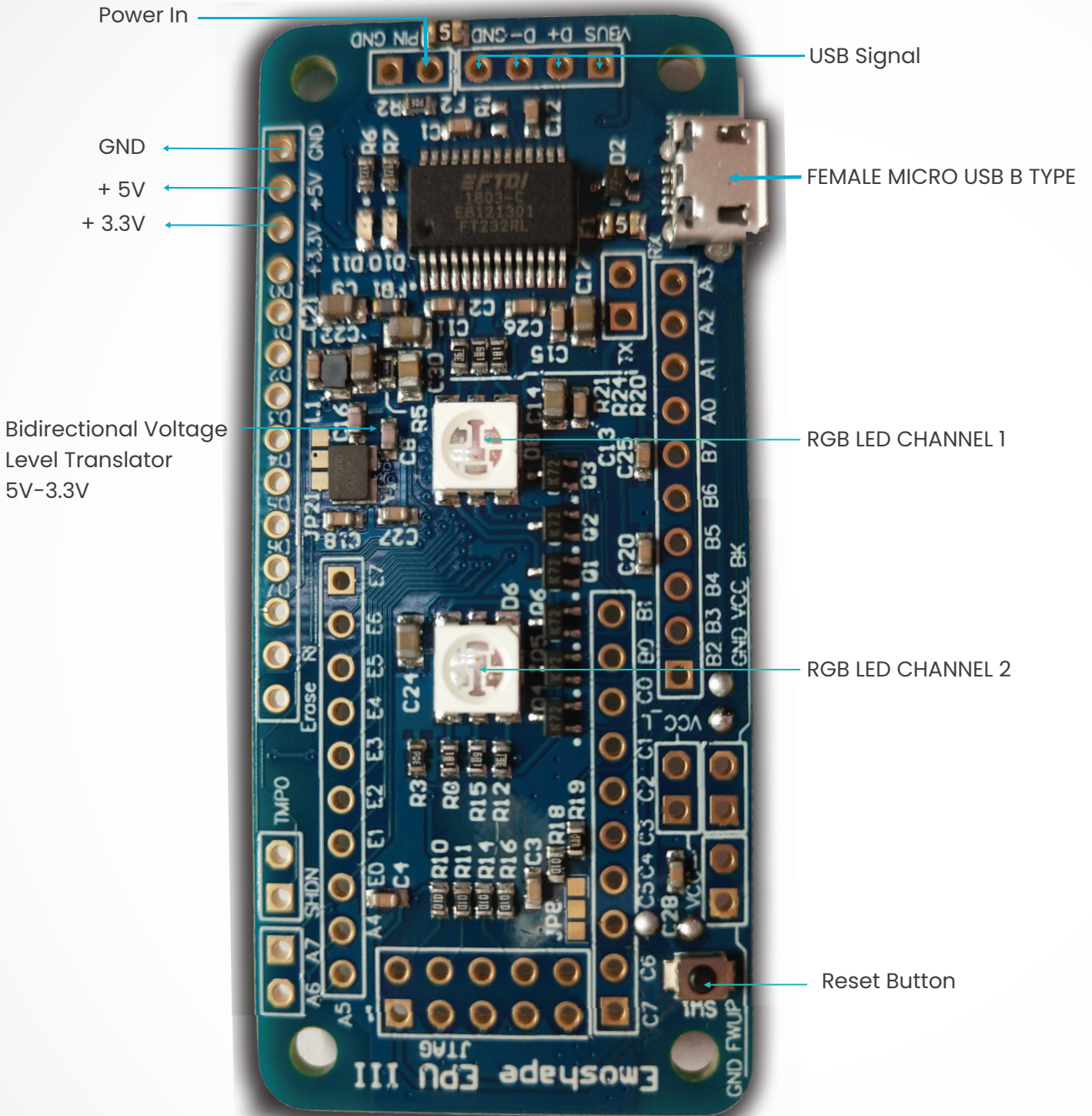
EPU III USB Dongle P&P

DEVELOPMENT BOARD

MetaSoul EPU III USB dongle gives developers immediate access to its advanced emotion processing engine, while allowing them to develop proprietary capabilities that provide true differentiation. This gives you a fully functional EPG® platform for quickly developing and deploying emotion capabilities for AI, Robots, consumer electronics, and more. The development board for EPU. It can be powered from USB, or from the PWR IN header. The inputs have PTC resettable fuses (500mA) and schottky diodes. Voltage is regulated by the onboard 3.3V, 250mA, extremely low quiescent current (2uA) LDO regulator that supports up to 16V DC input. Optionally, a 5V, 500mA low quiescent current (23uA) LDO regulator can also be installed, which supports up to 24V input. Along with the 5V regulator, an 8bit auto direction level shifter is installed, to provide level conversion between EPU II Vcc and 5V. Also mounted is a mini USB connector, reset-user button. The board has 48 main pins with 100 mil pin spacing which allows for mounting on a perfboard (or barely on a breadboard). There are 2 + 2 RGB LED. Power watts 0.24w per LED (6 lumen, 600 Mcd). Board have Jtag connector, that can work with JTAG/ICE interfaces. There are 17 solder jumpers for configuration flexibility. The pcb measures approx. 2.6" x 1.18" (65mm x 30mm) and 0.062" (1.6mm) thick. There are 4 2.7mm mounting holes.

EPU III DEV. BOARD

TOP VIEW / PINOUT



COMPETITIVE ADVANTAGE

- ✓ **True emotional states and appraisal** for Intelligent machines (Patented)
- ✓ More than 64 TN possible emotional states every 1/10s
- ✓ 12 human emotion with Pain/Pleasure for neural net learning
- ✓ Emotion appraisal by Wave Computing
- ✓ Pulse modulation output for physical Pain/Pleasure
- ✓ **100% secured** in a chip (Emotional polarity can't be reversed)
- ✓ **100% confidential**, no data transit in the cloud*
- ✓ 100% UpTime
- ✓ **Cost effective** the EPU do not charge by interaction (vs cloud)
- ✓ Unique Emotional Personality development (cloud EPG)
- ✓ Do not use and load the CPU or GPU
- ✓ Evaluation Kit that allows developers to create a **POC in less than 60 minutes**
- ✓ Providing true differentiation for a brand.
True Emotional Intelligence: Not just emotion recognition but real-time synthesis.
- ✓ **Secure & Private:** 100% on-device processing, ensuring data privacy.
- ✓ **Energy Efficient:** Operates independently without reliance on cloud computing.
- ✓ **Customizable Personalities:** AI develops unique behaviors for each user.
- ✓ **Seamless Integration:** Compatible with major robotics, IoT, and AI platforms.
- ✓ Applications
- ✓ EPU-III enables AI-driven emotional intelligence across multiple industries:
 - ✓ Humanoid Robotics
 - ✓ Autonomous social robots with adaptive emotional responses
 - ✓ AI-powered assistants for healthcare, education, and customer service
 - ✓ Gaming & Virtual Avatars
 - ✓ Emotionally responsive NPCs and virtual characters
 - ✓ Enhancing VR/AR with emotionally dynamic interactions
- ✓ IoT & Smart Devices
 - ✓ Smart home assistants with emotion-driven user engagement
 - ✓ Interactive toys that develop emotional personalities over time
- ✓ Licensing & Pricing
- ✓ **EPU-III Microcontroller:** Available upon request (MOQ: 100 units)
- ✓ **EPU-III USB Dongle:** Plug-and-play solution for developers
- ✓ **Cloud-Based Emotion Personality Computation:** Subscription model available

SETUP

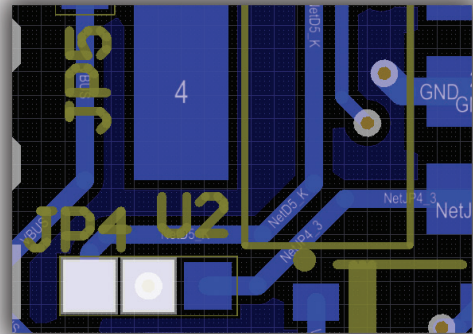
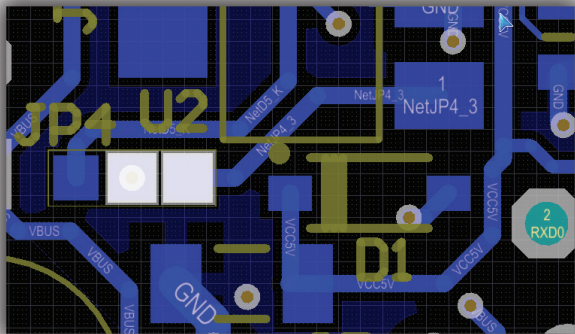
EVALUATION BOARD SETUP

Power setup

- ✓ For power source can be used USB connector, po go pins (if EPU connected to Pi Zero) or J3 (PWRIN pads)
- ✓ If Voltage Level Translator not used (C0-C7 I/O lines used for signals with 3.3V logic levels), JP4 must be close in this position

Using PWRIN

- ✓ For PWRIN pads input voltage can be in range 5-12.
- ✓ If used Voltage Level Translator (C0-C7 I/O lines used for signals with 5V logic levels),JP4 must be close in this position.



Power supply measure

JP7 jumper used for measure supply voltage.
If JP7 closed - PB23/AD4 used for measure supply voltage. This input connected to supply voltage through divider, so supply voltage can be calculated using the equation

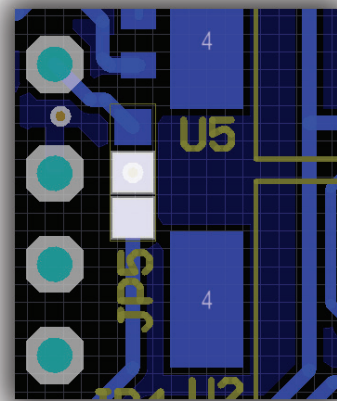
For example:

$V_{\text{measured}} = 0.8V$, so Supply voltage = $0.8 * 11 = 8.8V$

If JP7 open – supply voltage not measured.

Also for supply measure used JP5.

In case if for supply used PWRIN, JP5 must be close in this position

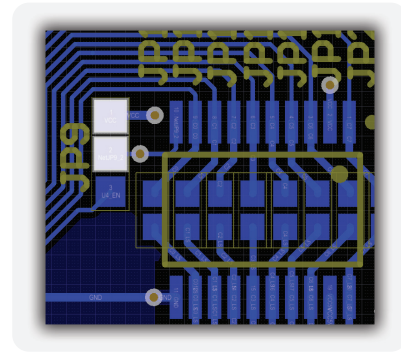


Port C setup

C0-C7 IO lines can work in 2 modes:

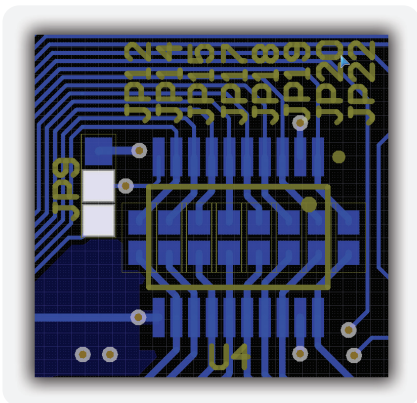
I/O lines used for signals with 5V logic levels

- ✓ Voltage Level Translator chip (U4) must be installed.
- ✓ JP12, JP14, JP15, JP17, JP18, JP19, JP20, JP22 must be open
- ✓ For Voltage Level Translator chip control used JP9.
- ✓ JP9 closed in this position – C0-C7 I/O lines always on



JP9 closed in this position – C0-C7 I/O lines controlled by PB14 pin:

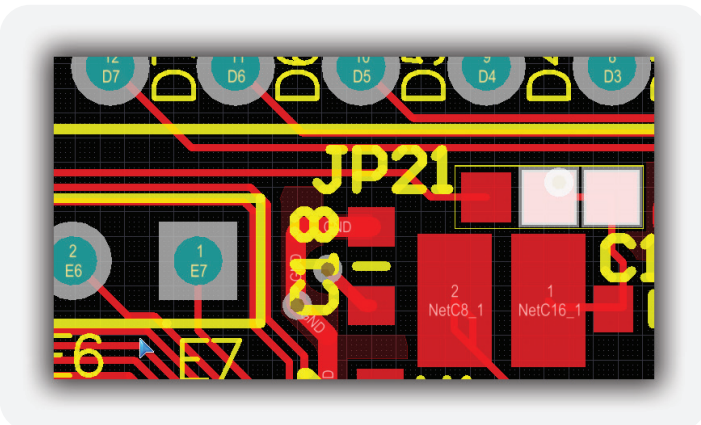
- ✓ PB14 = 1 // C0-C7 I/O lines on
- ✓ PB14 = 0 // C0-C7 I/O lines in 3-state mode



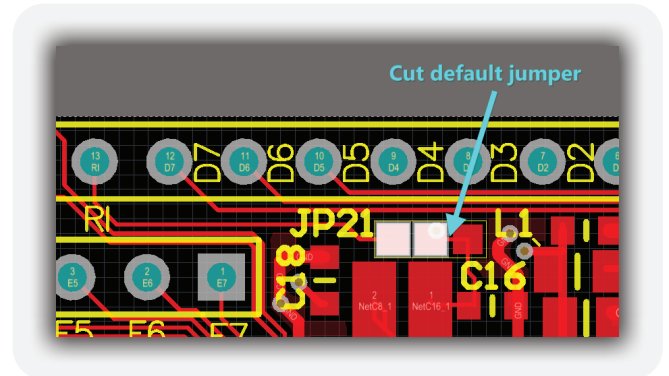
- ✓ 2.2 I/O lines used for signals with 3.3V logic levels.
- ✓ Voltage Level Translator chip (U4) must be not installed. This option must be specified at EPU order
- ✓ JP12, JP14, JP15, JP17, JP18, JP19, JP20, JP22 must be closed

Clock setup

- ✓ ATSAM4C32CA-AUR can have 2 external clock sources, for control used JP21
- ✓ 8 MHz onboard crystal default state (pads connected by default)

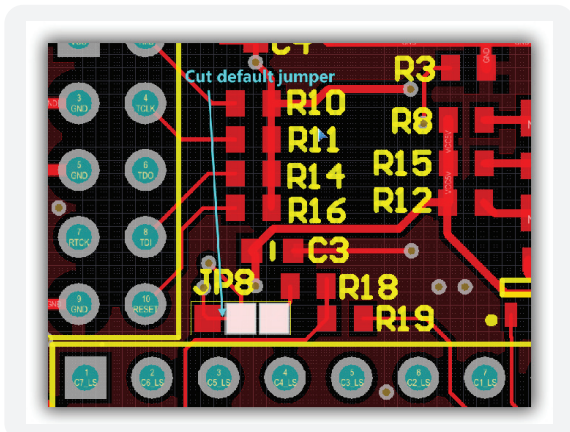
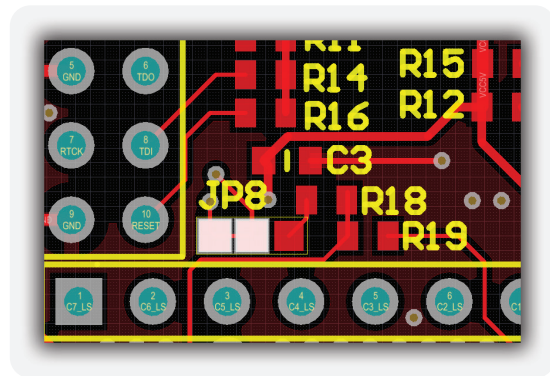


For external clock source used RI pad



Debug setup

- ✓ For ATSAM4C32CA-AUR debug can be used JTAG interface or ICE interface, for control used JP8.
- ✓ JTAG – default state (pads connected by default)



LICENSING AND PRICING

👁️ **Developer license & Evaluation Board**

This Station is for personal and commercial projects. License Limitations on Transfer and resell of data: Your limited license does not allow to transfer or resell any data from the Emotion processing Unit buffer for example, but not exclusively in a client server configuration.

👁️ **EPU III Micro-Controller and dongle ordering information**

- ✓ EPU III Quotation available on request. (MOQ > 100)
- EPU III USB dongle quotation available on request. (MOQ > 100)

👁️ **Cloud Base Emotion Personality Computation & e-NLP**

- ✓ Quotation available on request. (MOQ 100)



OVERVIEW

The Emotion Processing Unit III (EPU-III) is an advanced System-on-Chip (SoC) designed for autonomous humanoid robotics. This specialized chip facilitates real-time emotion synthesis, allowing AI systems to experience and react to emotional states dynamically. It enables a new generation of emotionally intelligent robots and AI-driven applications.

EPU-III integrates cutting-edge emotion synthesis technology with high-performance machine learning to process 12 core emotions, leveraging real-time psychometric algorithms to create a natural and adaptive AI experience.

Key Features

- ✓ **Emotion Synthesis Engine:**
Processes and reacts to 64 trillion emotional states every 1/10th of a second.
- ✓ **Multi-Platform Support:**
Runs seamlessly on Debian 12, Ubuntu, and Docker for flexible deployment.
- ✓ **Hybrid Deployment:**
Available as a physical microchip or edge-based Docker container.
- ✓ **High-Performance SoC:**
Integrated ARM 32-bit microcontroller with real-time emotion computation.
- ✓ **Emotion Profile Graph (EPG):**
Enables unique emotional experiences and adaptive AI personality development.
- Energy Efficient Design:**
Optimized for low power consumption with secure, standalone operation.
- ✓ **Patent-Protected:**
Covered under issued patent No. 10,424,318, with additional patents pending.
- ✓ **Technical Specifications**

- ✓ **Memory:** Integrated EPG emotion state storage
- ✓ **I/O Support:** Multiple PWM and GPIO interfaces
- ✓ **RGB Emotional Output:** 32 million colors for visual emotion representation
- ✓ **Emotion Processing Capabilities**
- ✓ **12 Core Emotions:** Anger, Fear, Sadness, Disgust, Indifference, Regret, Surprise, Anticipation, Trust, Confidence, Desire, and Joy.
- ✓ **Psychometric Learning:** Emotion states evolve through machine learning algorithms.
- ✓ **Emotion-Based Reinforcement:** AI adapts based on positive and negative stimuli.
- ✓ **Emotion Profile Graph (EPG):** Stores and recalls emotional experiences.
- ✓ **Software & Integration**
- ✓ **OS Compatibility:** Debian 12, Ubuntu, ROS
- ✓ **Deployment:** SaaS model, Docker container, or physical chip
- ✓ **SDK Support:** Available for C++, Python, and Qt frameworks
- ✓ **Cloud API:** Emotion computation available via MetaSoul API
- ✓ **How EPU-III Works**
- ✓ **Emotion-Based AI Learning**
- ✓ **EPU-III follows the Pain-Pleasure Principle,** where AI dynamically seeks to maximize pleasure and minimize pain, leading to more empathetic human-AI interactions.

🎯 **Positive Reinforcement:**

- ✓ AI detects user happiness via speech, gestures, or biometric signals.
- ✓ AI associates positive feedback with pleasurable emotional states, reinforcing beneficial interactions.
- ✓ **Negative Reinforcement:**
- ✓ AI detects negative emotions (e.g., sadness, frustration).
- ✓ AI attempts corrective actions to restore positive engagement.
- ✓ This approach enables the AI to develop unique personalities based on interaction history, making human-machine communication more natural and engaging.



CONCLUSION

The EPU-III SoC is the world's most advanced emotion processing chip, bridging the gap between AI and human-like emotional intelligence. Its cutting-edge emotion synthesis capabilities redefine how robots, avatars, and AI assistants interact and connect with users.

WEBSITE: www.metasoul.one

For further inquiries, reach out to MetaSoul Inc. at support@metasoul.one



METASOUL®

THANK YOU!

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