**IDEA-FAST**

**Identifying Digital Endpoints to Assess FAtigue, Sleep and acTivities in daily living in Neurodegenerative disorders and Immune-mediated inflammatory diseases.**

**Grant Agreement No. 853981**

**WP6 – Clinical Validation Study Organisation and Management**

# D6.1: First version of the CVS protocol

| | |
|---|---|
| **Lead contributor** | P2 – UKSH |
| | |
| **Other contributors** | P1 – UNEW, P7 – ECRIN, P43 – SARD |

| | |
|---|---|
| **Due date** | 31 JUL 2021 |
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| **Deliverable type** | R |
| **Dissemination level** | PU |

## Document History

| Version | Date | Description |
|---|---|---|
| V0.1 | 13 AUG 2021 | First version |
| V0.2 | 03 SEP 2021 | Reviewed version for submission to IMI |
| V0.3 | 04 OCT 2021 | Revised to include protocol for internal version |
| V0.4 | 15 OCT 2021 | Minor corrections |
| V1.0 | 18 OCT 2021 | Final version |

## Table of Contents

# 1 Abstract

Deliverable D6.1 describes the first version of the protocol for the clinical observational study (COS; formerly clinical validation study – CVS). As the study will be of observational nature and the focus is on identifying and evaluating digital parameters of fatigue, sleepiness and sleep disturbances in general, the consortium decided to rename the study "clinical observational study" to avoid the impression that the focus is on validating specific digital devices. The COS will follow 2000 participants (500 subjects each for Parkinson's Disease (PD) and Inflammatory bowel disease (IBD), 200 each for Huntington's Disease (HD), Rheumatoid Arthritis (RA), Systemic Lupus Erythematosus (SLE), Primary Sjögren's Syndrome (PSS) and healthy controls) in four visits over six months each. Each participant will attend two study visits at the recruitment centres at Month 0 and Month 6 of the COS, as well as two remote visits in between. Following each visit, participants will use a combination of digital health technologies in their own environment for one week each. We selected seven digital health technologies based on the Feasibility Study (FS) results, feature engineering exercises, analyses of relevant extant datasets and a literature review. Concomitant data on fatigue, sleep, selected ADLs and other confounding variables, together with other relevant contextual information will be collected remotely several times a day during the period of digital health technology use. The inclusion of two "remote visits" will enable us to collect data on acceptability, feasibility and operational challenges relating to the future use of these digital endpoints in a remote decentralised clinical trial setting, and will permit direct comparison of data quality, patient compliance and cost of a remote study versus a traditional clinical study. As far as possible in the framework of an observational study, a baseline blood test to screen for potential contributing factors of fatigue will be performed. We will also collect blood, urine and stool samples for biobanking (optional for participants, samples to be stored but not analysed in the context of this project). Our cohorts will be drawn from 22 centres across 10 countries within Europe, representing geographic, ethnic and healthcare diversity.

# 2 Introduction

Development of the COS Protocol started in early 2021 and was further refined following review by the IDEA-FAST Clinical Knowledge and Insight Taskforce and a device selection meeting in July 2021. All work packages were invited to comment on the protocol and once all discussion points have been resolved, the protocol is planned to be submitted initially to the Kiel ethics committee (as the Sponsor site) in fall 2021.

# 3 Overview of COS Protocol

The COS protocol is shown in Appendix A and a shortened version of the case report forms is shown in Appendix B. However, for confidentiality reasons, these appendices are not included in the public version of this deliverable.

In brief, the COS will recruit 2000 participants (500 subjects each for PD and IBD, 200 each for HD, RA, SLE, PSS and healthy controls) from 22 centres across 10 countries within Europe. The aim is to identify and evaluate digital parameters of fatigue and sleep (in particular sleep quality and daytime sleepiness) that reflect daily self-reported measures across all disease groups. In addition, the larger cohorts of IBD and PD will allow us to also explore potential disease-specific, digital fatigue and sleep endpoints. Each participant will attend four study visits, each followed by a week of digital technology use. Two study visits will be performed at the recruitment centres at Month 0 and Month 6, while the two visits in between will be done remotely, either via phone or video conference system. During the visits, participants undergo a comprehensive clinical assessment of their disease as well as assessment of fatigue, sleepiness and sleep disturbances using current "gold standard" tools (e.g. Patient Reported Outcome measures, PROs). Furthermore, data on confounding variables of fatigue, sleepiness and

sleep disturbance, such as mood and pain as well as other patient reported outcomes, will be collected. During the technology use periods at home, six digital health technologies will be used during all weeks: a movement sensor, a wearable device that records a continuous electrocardiogram, a sensor mat that records vital parameters while sleeping, an e-diary app that records concomitant data on fatigue, sleep and confounding variables and monitors app and phone usage, an app that records typing characteristics and a neurocognitive testing app. In addition, during the last technology use period, a headband that records a simplified electroencephalogram will be used at night. All devices that will be used are CE-certified (see appendix C for Declarations of Conformity). As far as possible in the framework of an observational study in the respective countries, a baseline blood test to screen for potential contributing factors of fatigue will be performed. For biobanking purposes, urine and stool samples as well as blood samples, if possible, will be collected. The sampling of biobanking materials is optional for participants. The samples will be stored but not analysed in the context of this project.

# 4 Conclusions

In conclusion, the COS will offer a unique opportunity to identify and evaluate composite digital parameters of fatigue, sleepiness and sleep disturbances. The COS protocol is currently already in an advanced stage and includes feedback from a variety of key stakeholders across the IDEA-FAST consortium including patients, clinicians, statisticians and engineers. After a final review by the Sponsor in October 2021, the protocol will be submitted to the Kiel ethics committee. Following approval by the Kiel ethics committee, the protocol will be submitted to all other ethics committees involved.

# Appendix A – *COS Protocol*

For confidentiality reasons, the Clinical Observation Study protocol is not included in the public version of this deliverable.

## Appendix B – *Case Report Forms*

For confidentiality reasons, the Case Report Forms are not included in the public version of this deliverable.

# Appendix C – *Declarations of Conformity*

SAMSUNG

# Declaration of Conformity

## Product details

For the following
Product : GSM WCDMA LTE Bluetooth/Wi-Fi Mobile Phone
Model(s) : SM-A405FM/DS

## Declaration & Applicable standards

We hereby declare, that the product above is in compliance with the essential requirements of the Radio Equipment Directive (2014/53/EU) by application of:

| | | |
|---|---|---|
| SAFETY | EN 50360 : 2017<br>EN 50566 : 2017<br>EN 50663 : 2017<br>EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013<br>EN 62311 : 2008 | |
| EMC | Draft EN 301 489-19 V2.1.0 (03-2017)<br>Draft EN 301 489-52 V1.1.0 (11-2016)<br>EN 301 489-17 V3.1.1 (02-2017) | Draft EN 301 489-3 V2.1.1 (03-2017)<br>EN 301 489-1 V2.1.1 (02-2017)<br>EN 55035 : 2017 |
| RADIO | Draft EN 303 345 V1.1.7 (03-2017)<br>EN 300 328 V2.1.1 (11-2016)<br>EN 300 440 V2.1.1 (03-2017)<br>EN 301 893 V2.1.1 (05-2017)<br>EN 301 908-13 V11.1.2 (07-2017)<br>EN 303 413 V1.1.1 (06-2017) | Draft EN 303 660 V1.1.1_0.0.6<br>EN 300 330 V2.1.1 (02-2017)<br>EN 301 511 V12.5.1 (03-2017)<br>EN 301 908-1 V11.1.1 (07-2016)<br>EN 301 908-2 V11.1.2 (08-2017) |

and the Directive (2011/65/EU) on the restriction of the use of certain hazardous substances in electrical and electronic equipment by application of EN 50581:2012.

and the Eco-Design Directive (2009/125/EC) implemented by Regulation (EC) No 1275/2008 for standby and off mode, and networked standby, electric power consumption using test methods from EN 50564:2011.

The Notified Body TÜV SÜD BABT, 0168 has reviewed the technical file for the product to assess the compliance of the product with requirements of the RED 2014/53/EU and has issued the EU-type examination certificate: RED1315i01

Samsung Electronics QA Lab.
Blackbushe Business Park Saxony Way,
Yateley, Hampshire GU46 6GG, UK*
2019.03.14
---
(Place and date of issue)

Stephen Colclough / Director of Regulatory Affairs
---
(Name and signature of authorized person)

* This is not the address of Samsung Service Centre. For the address or the phone number of Samsung Service Centre, see the warranty card or contact retailer where you purchased your product.

SAMSUNG

# Declaration of Conformity

## Product details

For the following
Product : GSM WCDMA LTE Bluetooth/Wi-Fi Mobile Phone
Model(s) : SM-A405FN/DS

## Declaration & Applicable standards

We hereby declare, that the product above is in compliance with the essential requirements of the Radio Equipment Directive (2014/53/EU) by application of:

| | | |
|---|---|---|
| SAFETY | EN 50360 : 2017<br>EN 50566 : 2017<br>EN 50663 : 2017<br>EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 | |
| EMC | Draft EN 301 489-19 V2.1.0 (03-2017)<br>Draft EN 301 489-52 V1.1.0 (11-2016)<br>EN 301 489-17 V3.1.1 (02-2017) | Draft EN 301 489-3 V2.1.1 (03-2017)<br>EN 301 489-1 V2.1.1 (02-2017)<br>EN 55035 : 2017 |
| RADIO | Draft EN 303 345 V1.1.7 (03-2017)<br>EN 300 330 V2.1.1 (02-2017)<br>EN 301 511 V12.5.1 (03-2017)<br>EN 301 908-1 V11.1.1 (07-2016)<br>EN 301 908-2 V11.1.2 (08-2017) | EN 300 328 V2.1.1 (11-2016)<br>EN 300 440 V2.1.1 (03-2017)<br>EN 301 893 V2.1.1 (05-2017)<br>EN 301 908-13 V11.1.2 (07-2017)<br>EN 303 413 V1.1.1 (06-2017) |

and the Directive (2011/65/EU) on the restriction of the use of certain hazardous substances in electrical and electronic equipment by application of EN 50581:2012.

and the Eco-Design Directive (2009/125/EC) implemented by Regulation (EC) No 1275/2008 for standby and off mode, and networked standby, electric power consumption using test methods from EN 50564:2011.

The Notified Body TÜV SÜD BABT, 0168 has reviewed the technical file for the product to assess the compliance of the product with requirements of the RED 2014/53/EU and has issued the EU-type examination certificate: RED1308i01

Samsung Electronics QA Lab.
Blackbushe Business Park Saxony Way,
Yateley, Hampshire GU46 6GG, UK*
2019.03.12
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(Place and date of issue)

Stephen Colclough / Director of Regulatory Affairs
---
(Name and signature of authorized person)

* This is not the address of Samsung Service Centre. For the address or the phone number of Samsung Service Centre, see the warranty card or contact retailer where you purchased your product.

SAMSUNG

# Declaration of Conformity

## Product details

For the following
Product : Mobile Phone
Model(s) : SM-A405S

## Declaration & Applicable standards

We hereby declare, that the product above is in compliance with the essential requirements of the Radio Equipment Directive (2014/53/EU) by application of:

| | | |
|---|---|---|
| SAFETY | EN 50360 : 2017<br>EN 50566 : 2017<br>EN 50663 : 2017<br>EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 | |
| EMC | Draft EN 301 489-1 V2.2.1 (03-2019)<br>EN 301 489-17 V3.1.1 (02-2017)<br>EN 301 489-3 V2.1.1 (03-2019) | Draft EN 301 489-52 V1.1.0 (11-2016)<br>EN 301 489-19 V2.1.1 (04-2019)<br>EN 55035 : 2017 |
| RADIO | Draft EN 303 345 V1.1.7 (03-2017)<br>EN 300 328 V2.1.1 (11-2016)<br>EN 300 440 V2.1.1 (03-2017)<br>EN 301 893 V2.1.1 (05-2017)<br>EN 301 908-13 V11.1.2 (07-2017)<br>EN 303 413 V1.1.1 (06-2017) | Draft EN 303 660 V1.1.1_0.0.6<br>EN 300 330 V2.1.1 (02-2017)<br>EN 301 511 V12.5.1 (03-2017)<br>EN 301 908-1 V11.1.1 (07-2016)<br>EN 301 908-2 V11.1.2 (08-2017) |

and the Directive (2011/65/EU) on the restriction of the use of certain hazardous substances in electrical and electronic equipment by application of EN 50581:2012.

and the Eco-Design Directive (2009/125/EC) implemented by Regulation (EC) No 1275/2008 for standby and off mode, and networked standby, electric power consumption using test methods from EN 50564:2011.

The Notified Body TÜV SÜD BABT, 0168 has reviewed the technical file for the product to assess the compliance of the product with requirements of the RED 2014/53/EU and has issued the EU-type examination certificate: RED1443i01

Samsung Electronics QA Lab.
Blackbushe Business Park Saxony Way,
Yateley, Hampshire GU46 6GG, UK*
2019.06.12
---
(Place and date of issue)

Stephen Colclough / Director of Regulatory Affairs
---
(Name and signature of authorized person)

* This is not the address of Samsung Service Centre. For the address or the phone number of Samsung Service Centre, see the warranty card or contact retailer where you purchased your product.

# VERIFICATION OF COMPLIANCE

| | |
|---|---|
| **Issue Date:** | Mar. 16, 2021 |
| **Applicant:** | COMPAL ELECTRONICS, INC. |
| **Address:** | NO. 385, YANG-GUANG ST., NEIHU DISTRICT, TAIPEI CITY 114, TAIWAN. |
| **Manufacturer:** | Dreem SAS |
| **Address:** | 34 Boulevard des Italiens, 75009 Paris - France |
| **Contact Information:** | Web: dreem.com<br>TEL#: 02-87516228 ext.18190<br>E-mail#: JerryTC_Feng@compal.com |
| **Product:** | Neuroband |
| **Brand Name/Trade Mark:** | Dreem |
| **Model/Type:** | Dreem3 |
| **Added Model(s):** | Dreem3SB |
| **Applicable Standards:** | EN 301 489 –1 v2.2.3 : 2019-11, EN 301 489 –17 v3.2.4 : 2020-09<br>EN 55032 : 2015+A11:2020<br>EN 61000-3-2 : 2014, EN 61000-3-3 : 2013+A1:2019<br>EN 61000-4-2 : 2009, EN 61000-4-5 : 2014+A1:2017<br>EN 61000-4-3 : 2006+A1:2008+A2:2010, EN 61000-4-6 : 2014<br>EN 61000-4-4 : 2012, EN 61000-4-11 : 2004+A1:2017 |
| **Test Laboratory:** | SGS Taiwan Ltd.<br>Electromagnetic Compatibility Laboratory<br>No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan |
| **Test Report No.:** | MW/2020/70013, dated on Mar. 16, 2021 |

**Conclusion:** Based upon a review of the Test Report(s), the tested sample of the product mentioned above is deemed to comply with the requirements of the above standards.

**Note:** This verification is only valid for the product and configuration described and in conjunction with the test report as detailed above.

**Authorised Signatory:**

Victor Wen

**SGS Taiwan Ltd.**
**Victor Wen**
**Assistant Manager**

# Axivity Ltd.

*The Core, Bath Lane, Newcastle Helix, Newcastle upon Tyne, NE4 5TF, United Kingdom*

## EU DECLARATION OF CONFORMITY

**The EU Directives covered by this Declaration**

2014/30/EU Electromagnetic Compatibility Directive
2014/35/EU Low Voltage Equipment Directive

**The Products Covered by this Declaration**

*AX6 Logging Inertial Sensor*

**The Basis on which Conformity is being Declared**

The product identified above complies with the requirements of the above EU Directives by meeting the following standards:

| | |
|---|---|
| EN 55032:2015 | Electromagnetic compatibility of multimedia equipment - Emission Requirements |
| EN 55024:2010+A1:2015 | Information technology equipment - Immunity characteristics - Limits and methods of measurement |

EN 55032: 2015 and EN *55024:*2010+A1:2015 refer to the following tests:

| Test | Standard | Dated Reference |
|---|---|---|
| Conducted RF Immunity | EN 6 1000-4-6 | 2009 |
| Radiated RF Immunity | EN 6 1000-4-3<br>A1<br>A2 | 2006<br>2008<br>2010 |
| Immunity to Fast, Low Energy Transients (Bursts) | EN 61000-4-4 | 2004 |
| Immunity to Slow High Energy Transients (Surges) | EN 61000-4-5 | 2006 |
| Immunity to Electrostatic Discharge | EN 61000-4-2 | 2009 |
| Power Frequency Magnetic immunity | EN 61000-4-8 | 2010 |
| Voltage Dips and Interruptions | EN 61000-4-11 | 2004 |
| Radiated Emissions | EN 55016-2-3<br>A1<br>A2 | 2010<br>2013<br>2014 |
| Conducted Emissions | EN 55016-2-1<br>A1<br>A2 | 2009<br>2011<br>2013 |

The products has been deemed safe to use on the following basis:

- It has a self enclosed, non-replaceable, 3.7V Lithium Polymer Cell
- The products has no sharp edges
- The products does not contain explosive, toxic or volatile parts

All the relevant testing has been completed to ensure the device complies to the above standards. The technical documentation required to demonstrate that the product meets the requirements of the Low Voltage Directive is available for inspection by the relevant enforcement authorities. The CE mark was first applied in: February 2019.

**Declaration Of Conformity**

I, Dr Karim Ladha of Axivity Ltd, certify that the products described above comply with the essential requirements of the directives specified.

**Signed on behalf of Axivity Ltd**
**Date:** 1st February 2019
**Authority:** Electronic Engineer, Axivity Ltd

**ATTENTION!**

**The attention of the specifier, purchaser, installer, or user is drawn to special measures and limitations to use which must be observed when the product is taken into service to maintain compliance with the above directives. Details of these special measures and limitations to use are available on request, and are also contained in the product manuals**

# CERTIFICATE

## EC No 1434-MDD-443/2019
**Full Quality Assurance System**

**Directive 93/42/EEC concerning medical devices**

Polish Centre for Testing and Certification certifies
that the quality assurance system in the organization:

## VitalConnect, Inc.
## 224 Airport Parkway, Suite 300
## San Jose, California 95110 UNITED STATES

for the design, manufacture and final inspection of medical devices, class: Class IIa

## Wireless Monitoring System for continuous collection of vital and non-vital physiological processes data in home and healthcare settings
## Model/Type: VitalPatch Biosensor

**complies with requirements of Annex II (excluding Section 4) to Directive 93/42/EEC (as amended) implemented into Polish law, as evidenced by the audit conducted by the PCBC**

Validity of the Certificate: from 04.08.2019 to 03.08.2024
The date of issue of the Certificate: 04.08.2019
The date of the first issue of the Certificate: 25.04.2019

CE 1434

Application No: 773/2019
Module H2/3/4/5

Michał Pachowski. Ph.D.
President


Certificate No. **1434-MDD-/2019**
Issued under the Contract No. **MD-200/2019**
Bears the PCBC hologram
Warsaw, 04/08/2019

# EU Declaration of Conformity

1. **Product model:** VitalTracker

2. **Name and address of the manufacturer or his authorised representative:**

eLive Ecosystem Inc
Puistokatu 5
57100 Savonlinna
Finland
info@elive.fi

3. **This declaration of conformity is issued under the sole responsibility of the manufacturer.**

4. **Object of the declaration:**

Equipment: VitalTracker
Brand name: eLive.care
Model/type: VT1000

5. **The object of the declaration described above is in conformity with the relevant Union harmonization legislation:**

Electromagnetic Compatibility Directive (EMC) 2014/30/EU,
Radio Equipment Directive (RED) 2014/53/EU,
Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU and
Waste electrical and electronic equipment directive (WEEE) 2012/19/EC

6. **References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared:**

| | |
|---|---|
| EMC: | EN 55024:2010 |
| | EN 301 489-1 Ver.3.1.1 |
| | EN 301 489-17 Ver.3.1.1 |
| RED: | EN 300 328 Ver.2.1.1 |
| | EN 301 893 Ver.2.1.0 |
| RoHS: | IEC 63000:2018 |
| WEEE | EN 50419:2006 |

7. **Signed for and on behalf of:**

Savonlinna 6.3.2020

Manufacturer:
eLive Ecosystem Inc

Mikko Saajanlehto, Chief Executive Officer (CEO)

# EU Declaration of Conformity

1. **Product model:** eBedSensor

2. **Name and address of the manufacturer or his authorised representative:**

eLive Ecosystem Inc
Puistokatu 5
57100 Savonlinna
Finland
info@elive.fi

3. **This declaration of conformity is issued under the sole responsibility of the manufacturer.**

4. **Object of the declaration:**

Equipment: eBedSensor
Brand name: eLive.care
Model/type: WB1000

5. **The object of the declaration described above is in conformity with the relevant Union harmonization legislation:**

Electromagnetic Compatibility Directive (EMC) 2014/30/EU,
Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU and
Waste electrical and electronic equipment directive (WEEE) 2012/19/EC

6. **References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared:**

| | |
|---|---|
| EMC: | EN 55024:2010<br>EN 61000-4-2:2008 |
| RoHS: | IEC 63000:2018 |
| WEEE | EN 50419:2006 |

7. **Signed for and on behalf of:**

Savonlinna 6.3.2020

Manufacturer:
eLive Ecosystem Inc

Mikko Saajanlehto, Chief Executive Officer (CEO)