

Supplementary material

Rapid on-site detection of illicit drugs in smuggled samples with a portable electrochemical device

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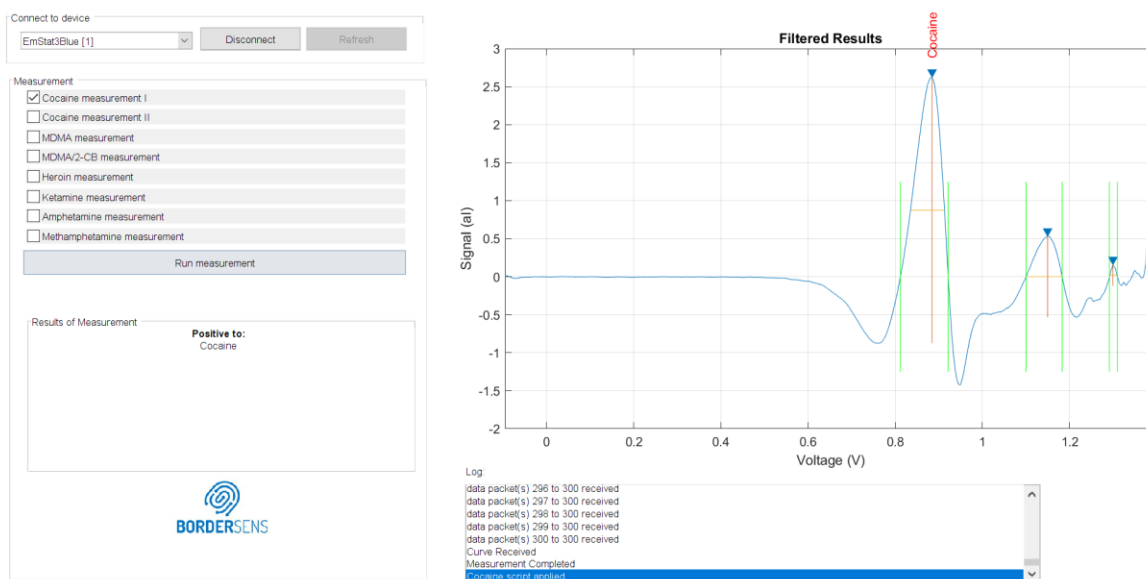


Figure S1. Example of the interface displayed in a laptop showing a positive result for cocaine along with its electrochemical profile.

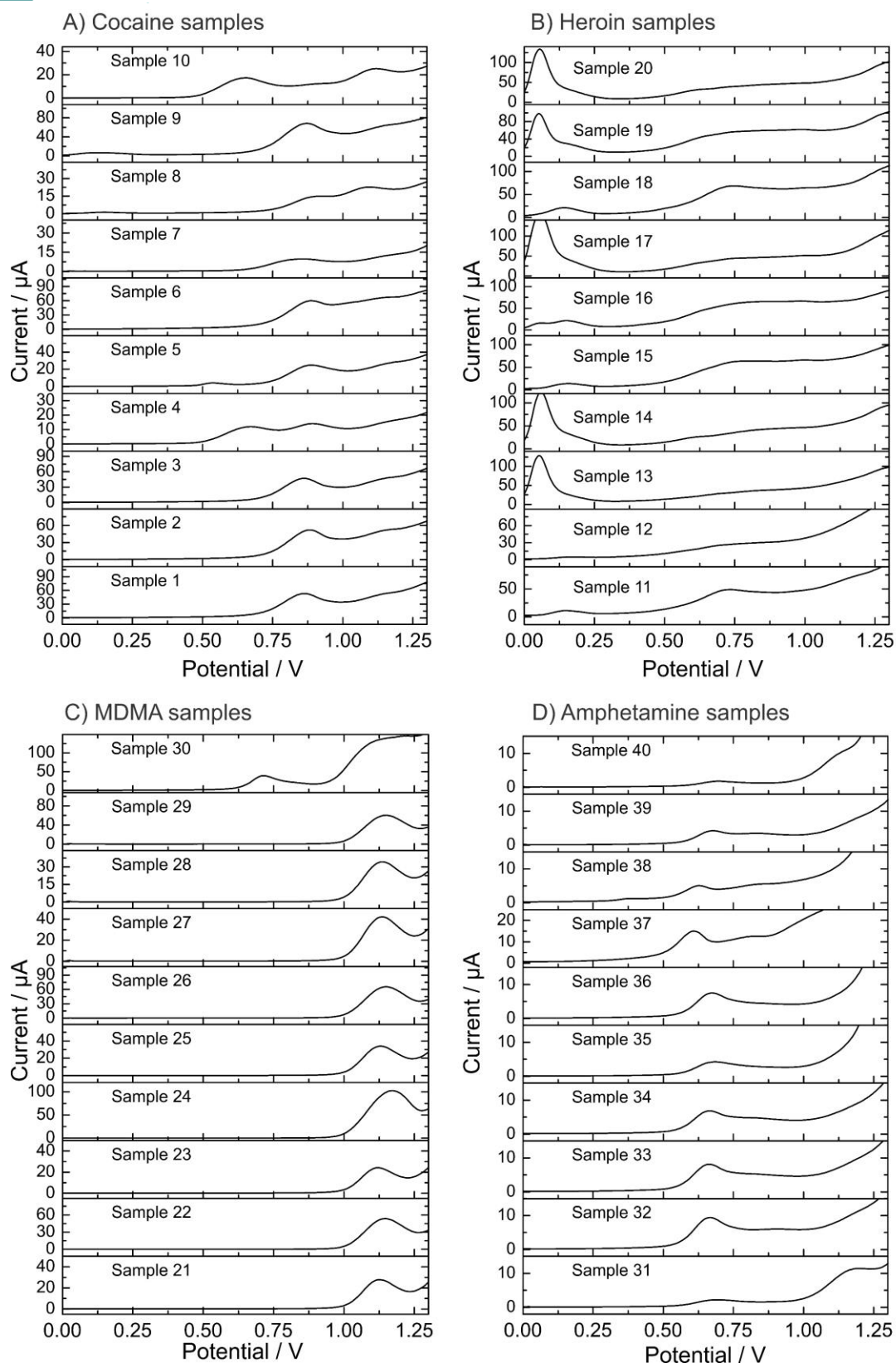


Figure S2. Square-wave voltammograms from the electrochemical analysis of the confiscated samples: A) cocaine samples, B) heroin samples, C) MDMA samples, and D) amphetamine samples.

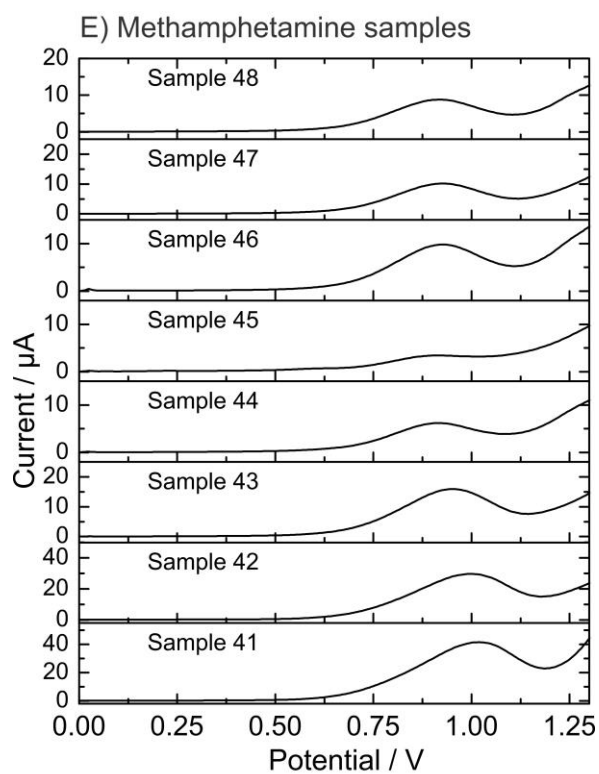


Figure S2 cont. Square-wave voltammograms from the electrochemical analysis of the confiscated samples: E) Methamphetamine samples.

Figure S3. Compilation of the screenshots from the analytical outputs obtained after the electrochemical analysis.

Sample 1

Connect to device
EmStat3Blue [1] Disconnect Refresh

Measurement

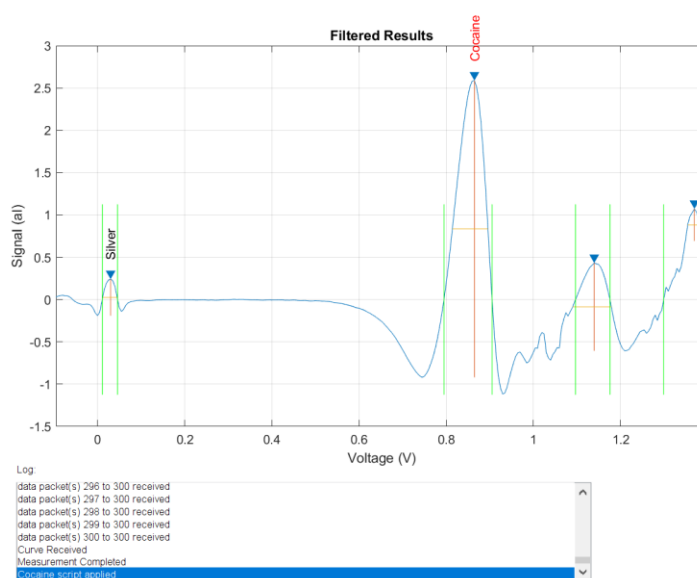
☒ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Silver
Cocaine





Sample 2

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

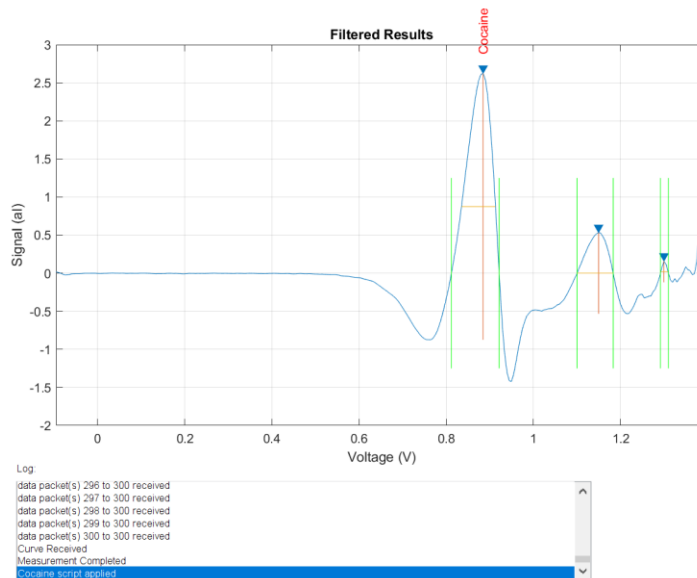
☒ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Cocaine






Sample 3

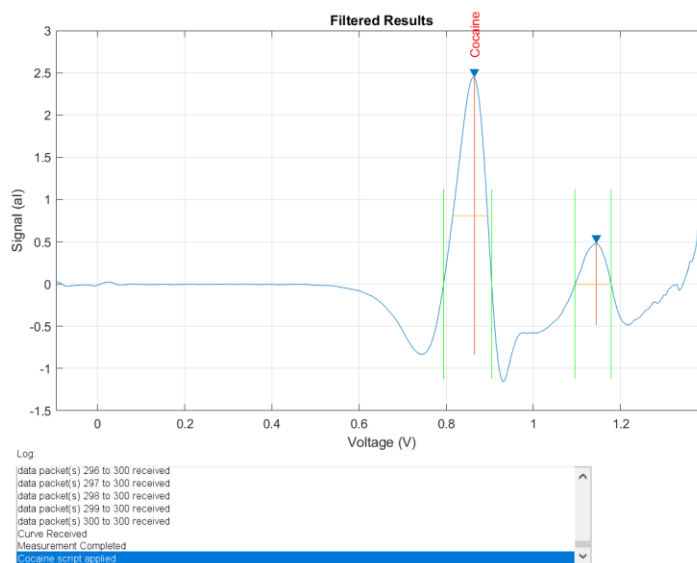
Connect to device
 EmStat3Blue [1] Disconnect Refresh

Measurement
☒ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement
Positive to:
 Cocaine





Sample 4

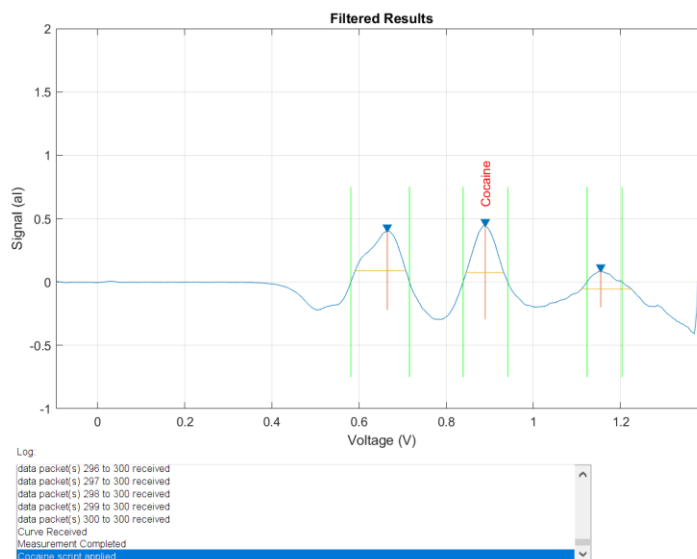
Connect to device
 EmStat3Blue [1] Disconnect Refresh

Measurement
☒ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement
Positive to:
 Cocaine





Sample 5

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

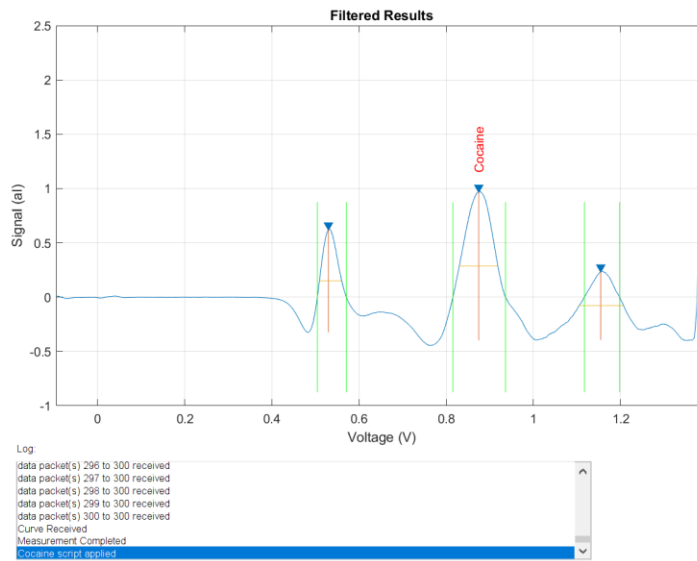
☒ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Cocaine





Sample 6

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

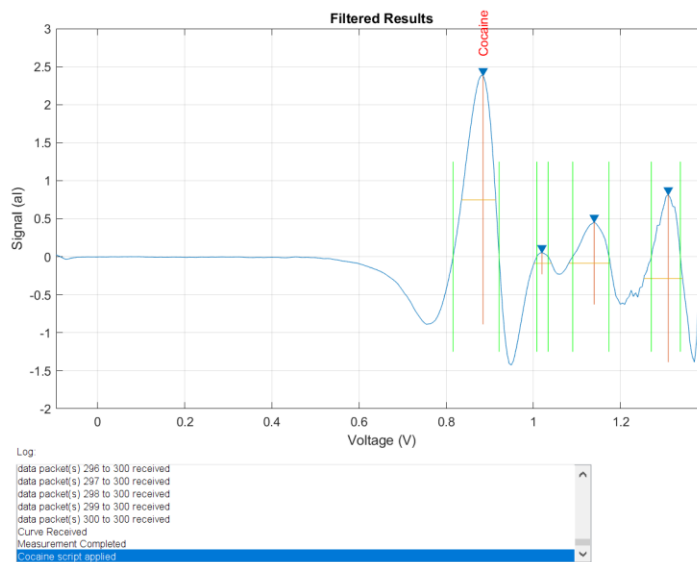
☒ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Cocaine





Sample 7

Connect to device
EmStat3Blue [1] Disconnect Refresh

Measurement

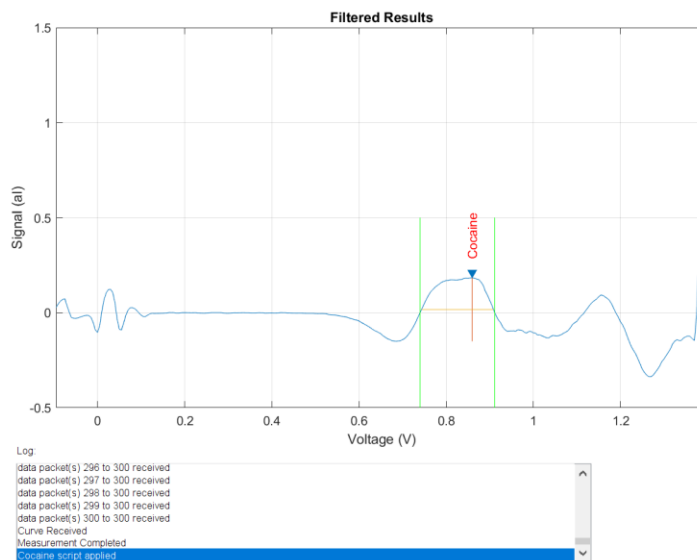
☒ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Cocaine





Sample 8

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

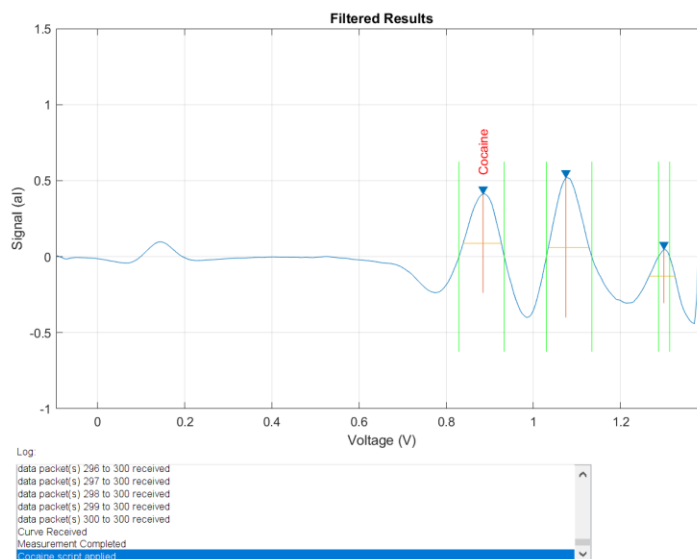
☒ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Cocaine





Sample 9

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

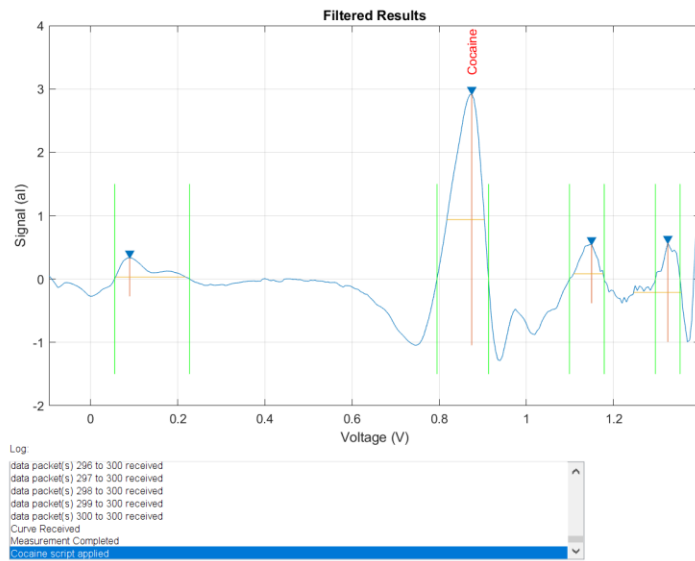
☒ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Cocaine





Sample 10

Connect to device
EmStat3Blue [1] Disconnect Refresh

Measurement

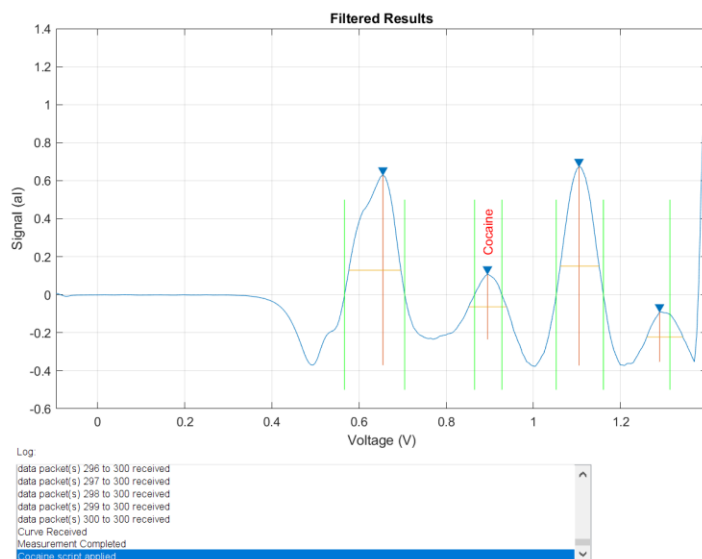
☒ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Cocaine





Sample 11

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

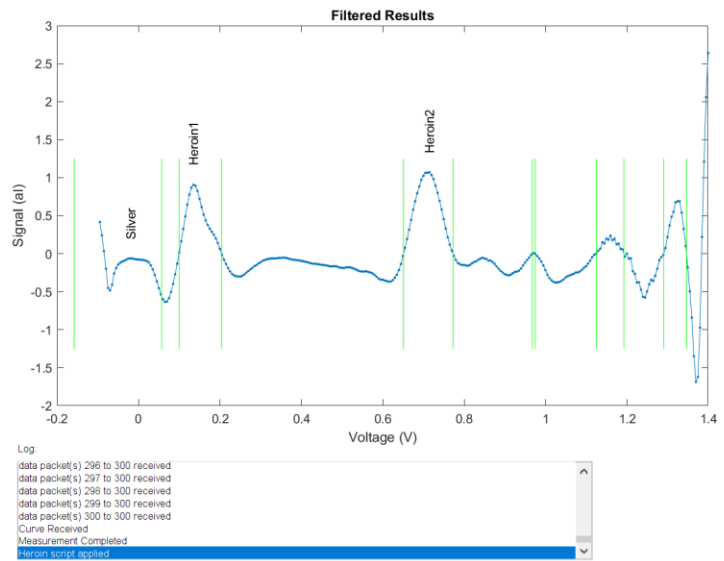
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☒ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Silver
Heroin1
Heroin2





Sample 12

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

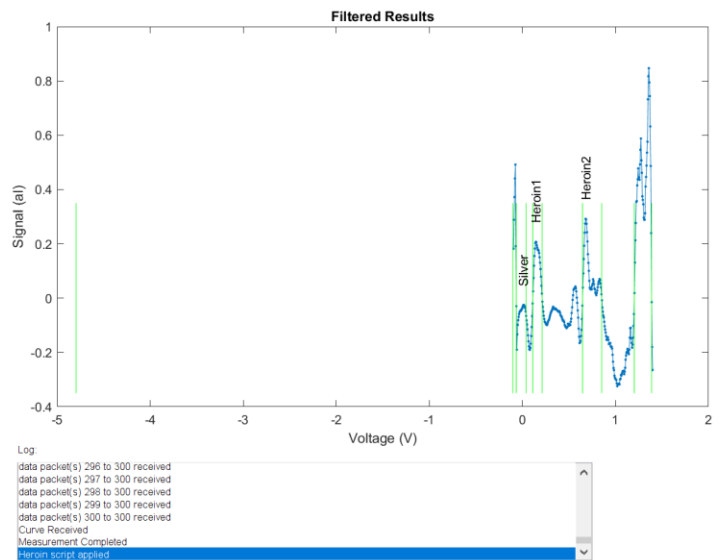
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☒ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Silver
Heroin1
Heroin2





Sample 13

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

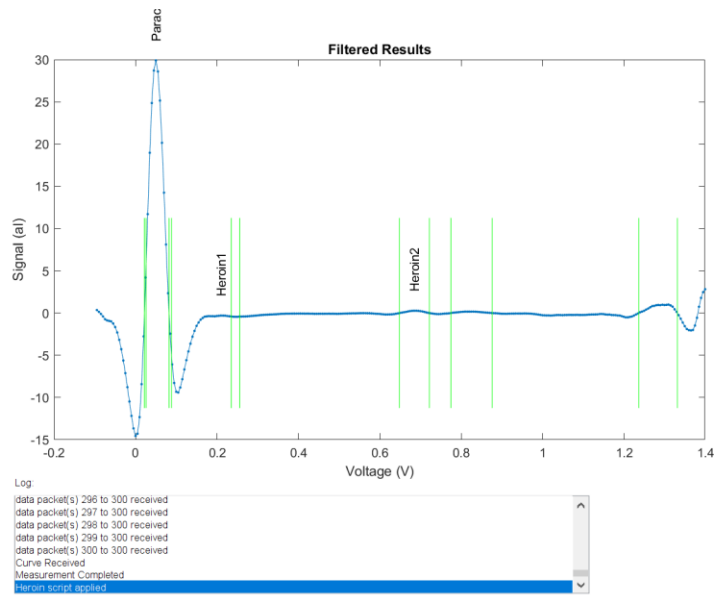
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☒ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Paracetamol
Heroin1
Heroin2





Sample 14

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

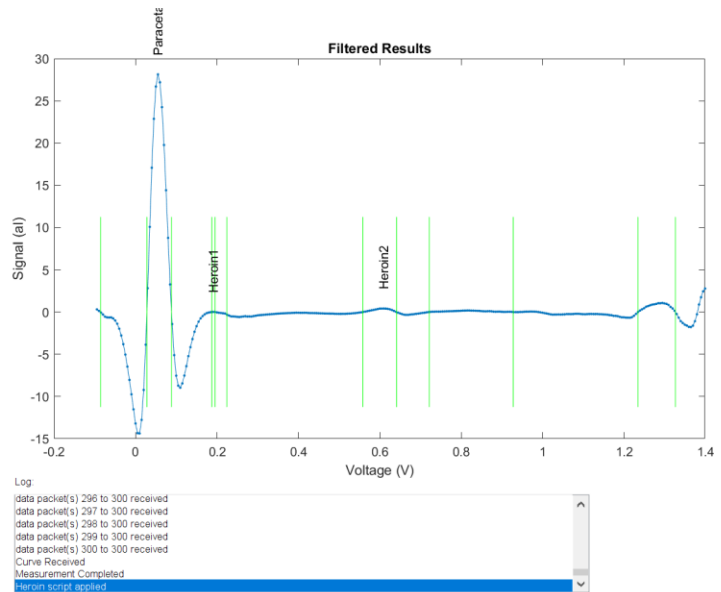
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☒ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Paracetamol
Heroin1
Heroin2





Sample 15

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

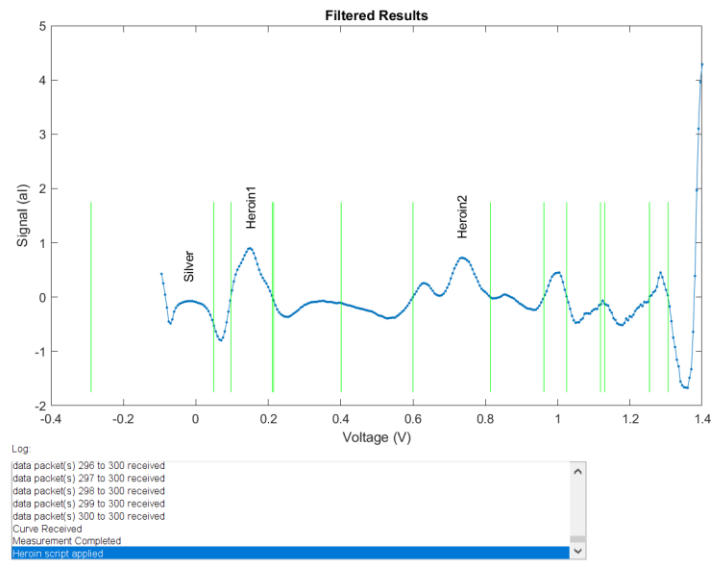
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☒ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Silver
Heroin1
Heroin2





Sample 16

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

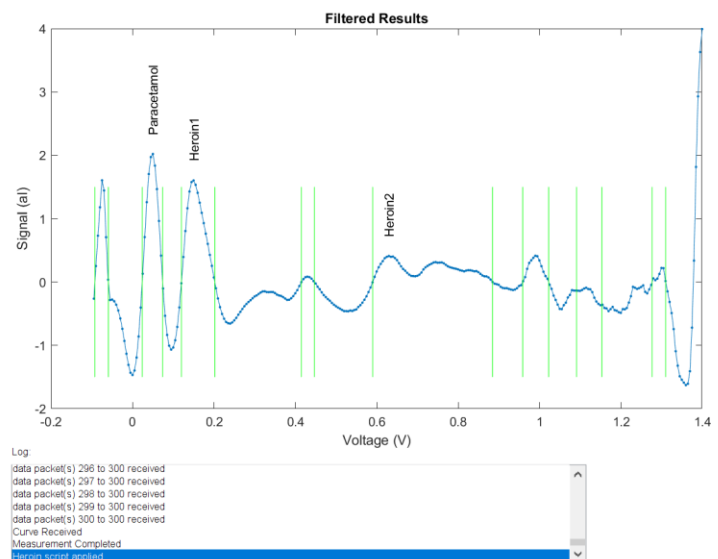
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☒ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Paracetamol
Heroin1
Heroin2





Sample 17

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

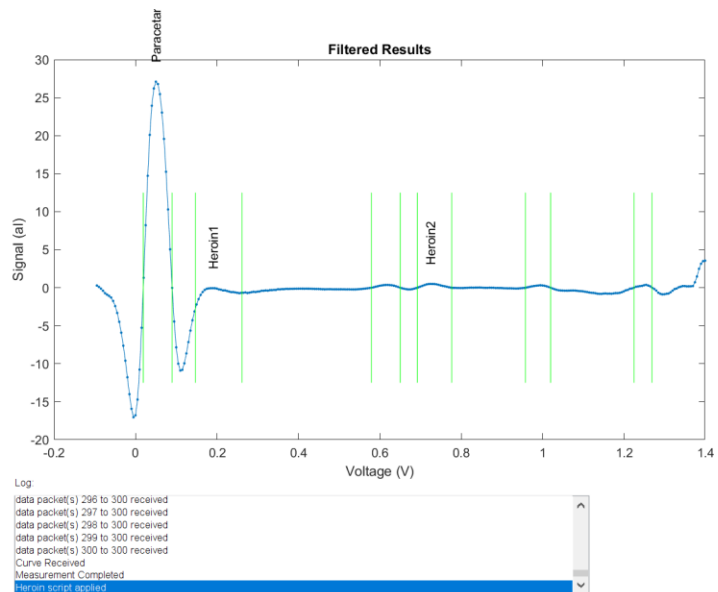
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☒ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Paracetamol
Heroin1
Heroin2





Sample 18

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

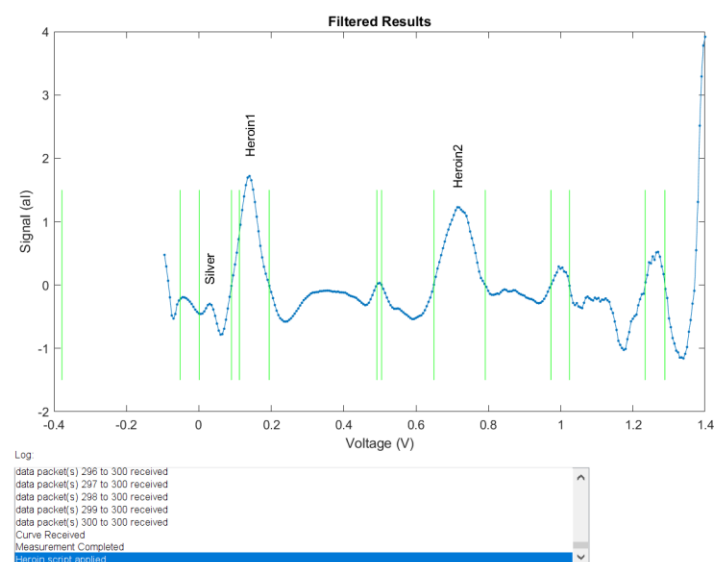
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☒ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Silver
Heroin1
Heroin2





Sample 19



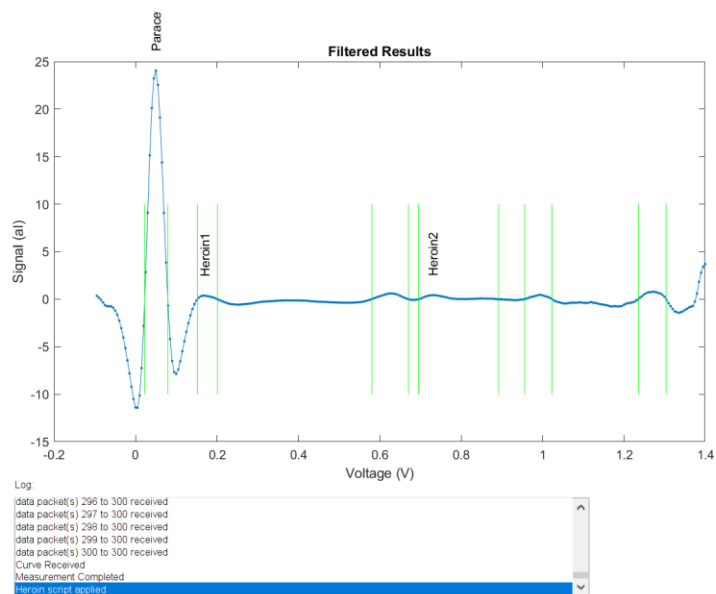
Connect to device
EmStat3Blue [1] Disconnect Refresh

Measurement
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☒ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement
Positive to:
Paracetamol
Heroin1
Heroin2

BORDERSSENS



Sample 20

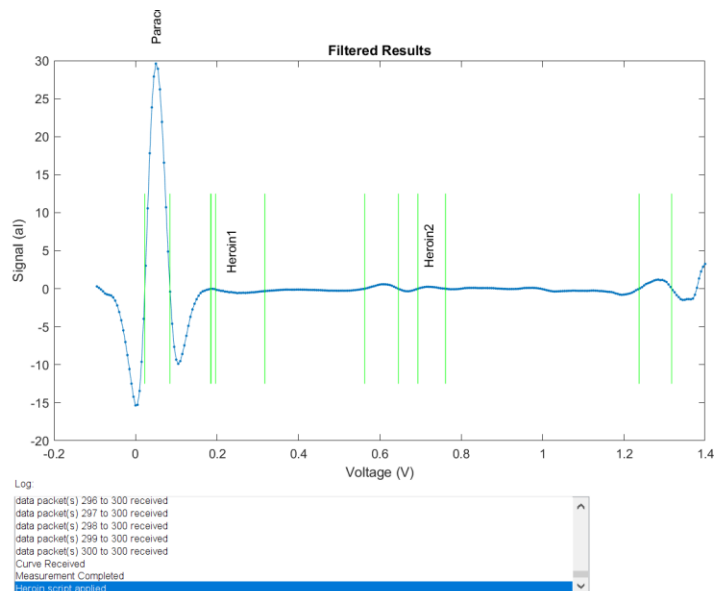
Connect to device
EmStat3Blue [1] Disconnect Refresh

Measurement
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☒ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement
Positive to:
Paracetamol
Heroin1
Heroin2

BORDERSSENS



Sample 21

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

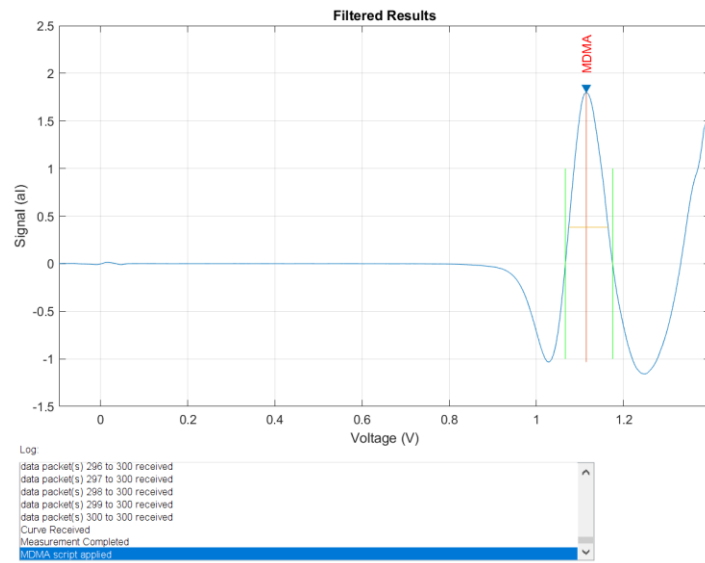
☐ Cocaine measurement I
☐ Cocaine measurement II
☒ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
MDMA





Sample 22

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

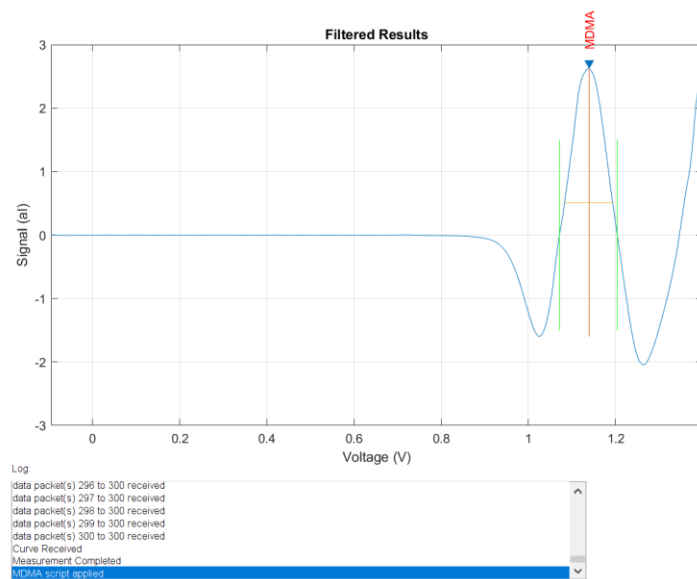
☐ Cocaine measurement I
☐ Cocaine measurement II
☒ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
MDMA





Sample 23

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

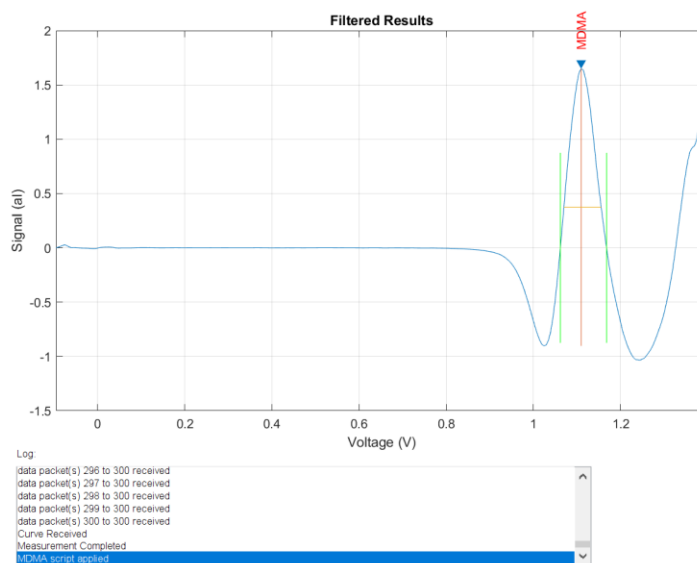
☐ Cocaine measurement I
☐ Cocaine measurement II
☒ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
MDMA





Sample 24

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

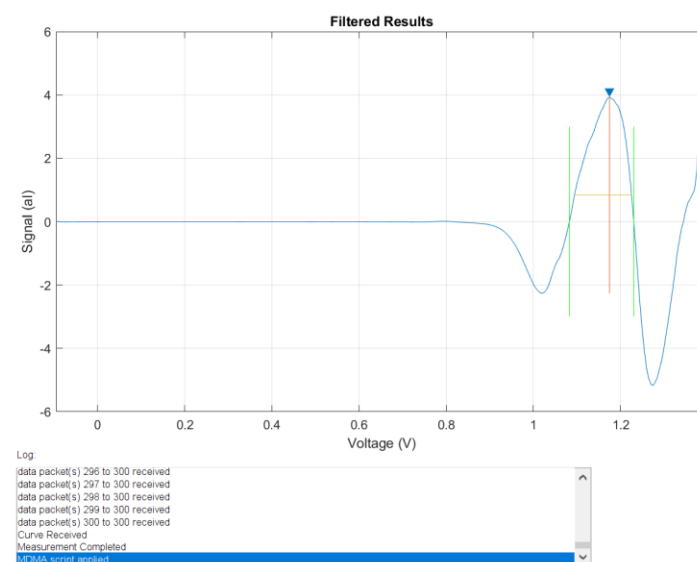
☐ Cocaine measurement I
☐ Cocaine measurement II
☒ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:





Sample 25

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

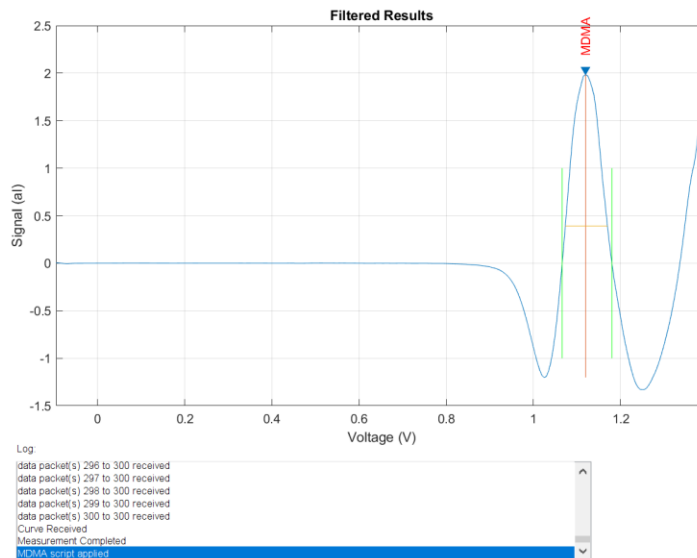
☐ Cocaine measurement I
☐ Cocaine measurement II
☒ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
MDMA





Sample 26

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

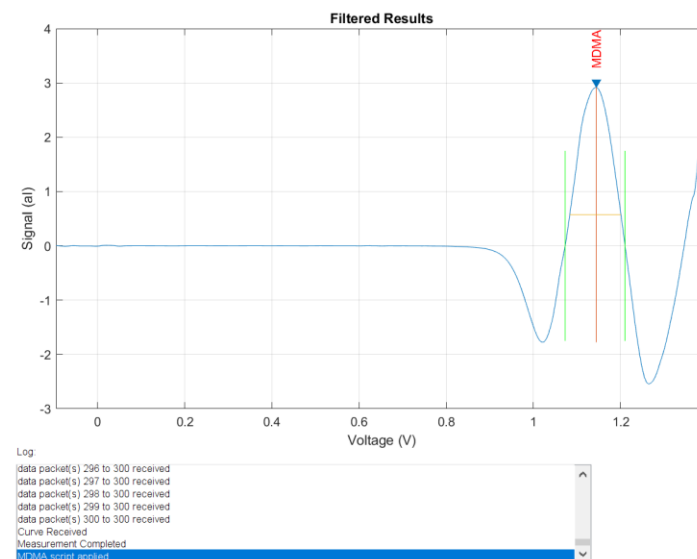
☐ Cocaine measurement I
☐ Cocaine measurement II
☒ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
MDMA





Sample 27

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

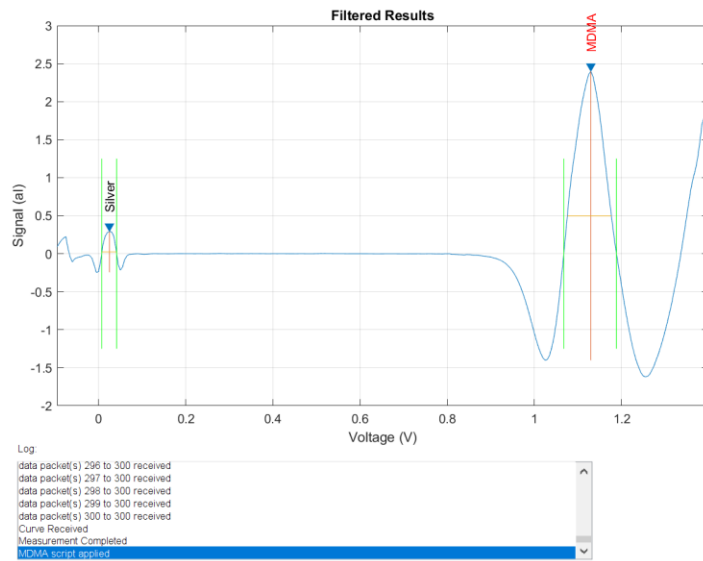
☐ Cocaine measurement I
☐ Cocaine measurement II
☒ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Silver
MDMA





Sample 28

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

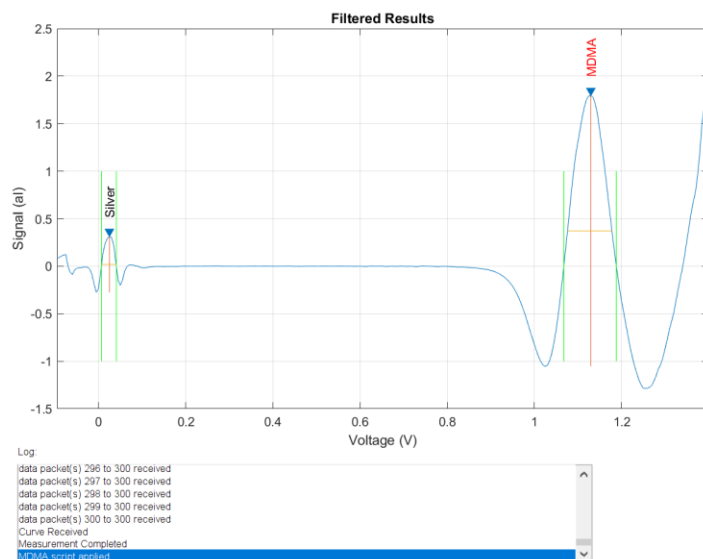
☐ Cocaine measurement I
☐ Cocaine measurement II
☒ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Silver
MDMA





Sample 29

Connect to device
EmStat3Blue [1] Disconnect Refresh

Measurement

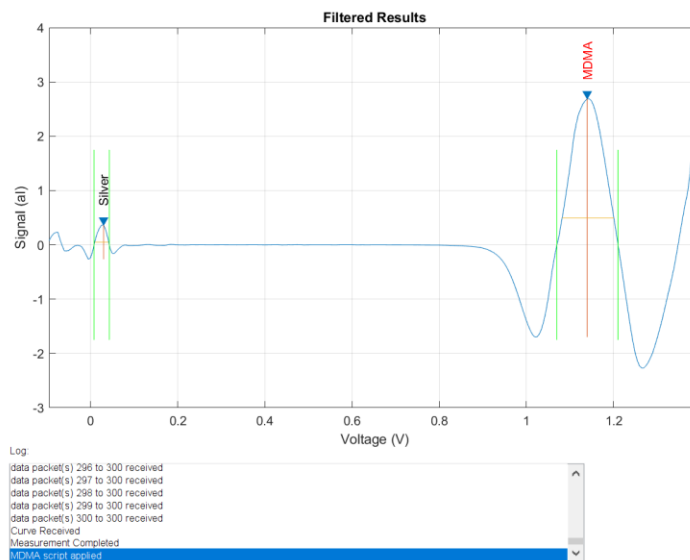
☐ Cocaine measurement I
☐ Cocaine measurement II
☒ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Silver
MDMA





Sample 30

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

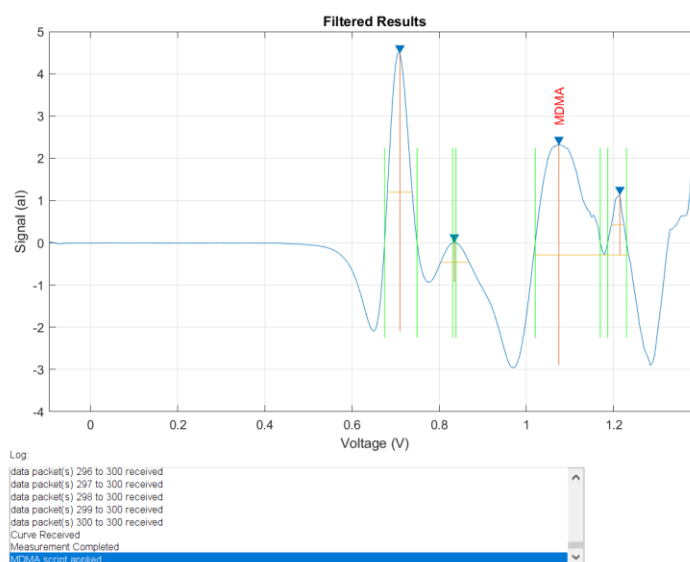
☐ Cocaine measurement I
☐ Cocaine measurement II
☒ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
MDMA





Sample 31

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

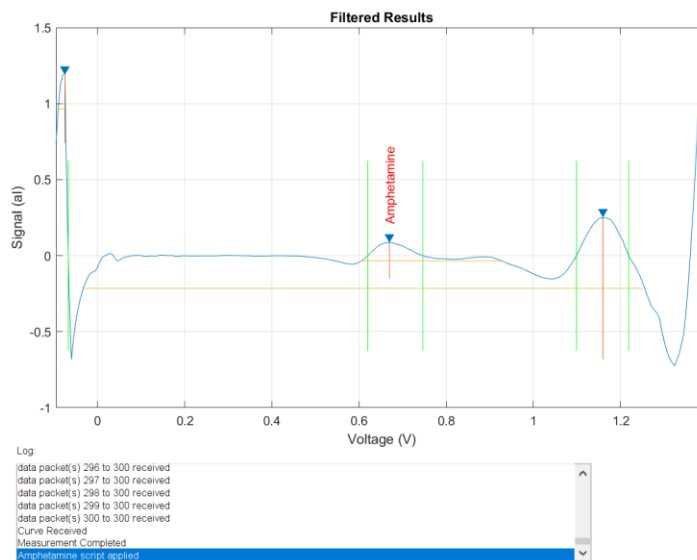
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☒ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Amphetamine





Sample 32

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

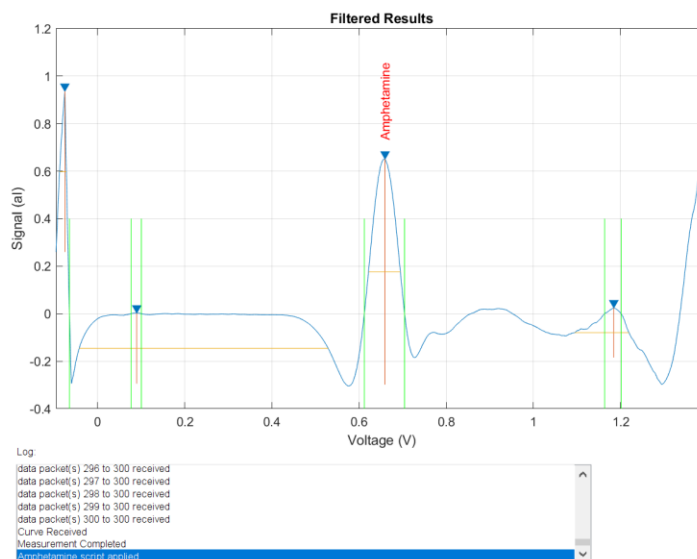
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☒ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Amphetamine





Sample 33

Connect to device
EmStat3Blue [1] Disconnect Refresh

Measurement

☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☒ Amphetamine measurement
☐ Methamphetamine measurement

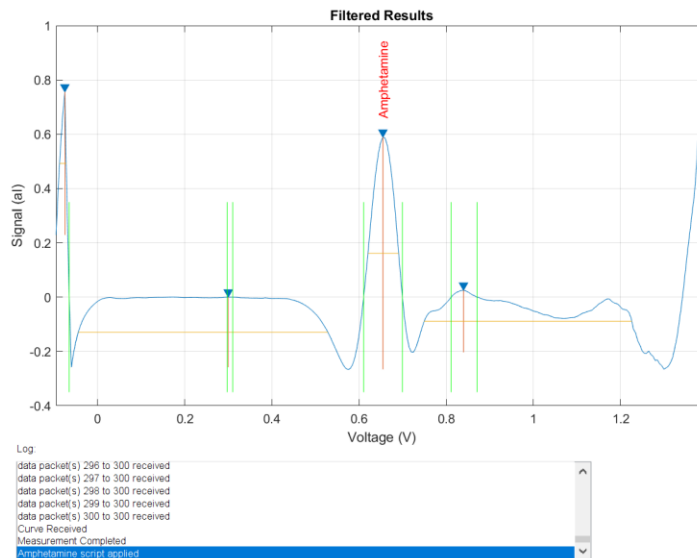
Run measurement

Results of Measurement

Positive to:

Amphetamine





Sample 34

Connect to device
EmStat3Blue [1] Disconnect Refresh

Measurement


☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☒ Amphetamine measurement
☐ Methamphetamine measurement

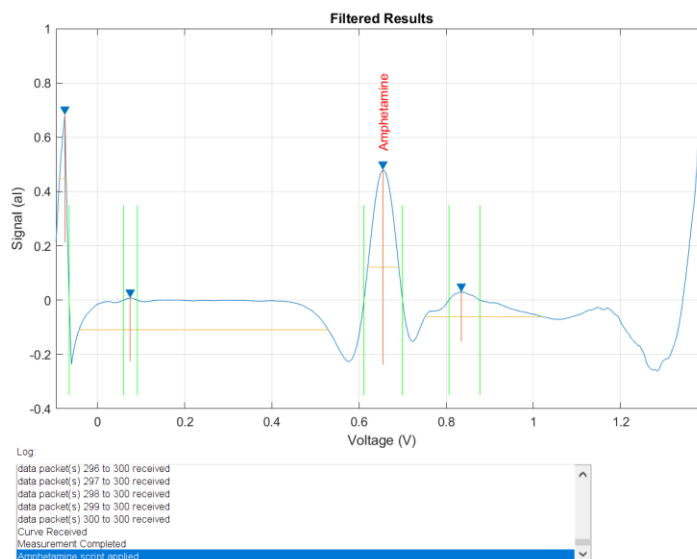
Run measurement

Results of Measurement

Positive to:

Amphetamine





Sample 35

Connect to device
EmStat3Blue [1] Disconnect Refresh


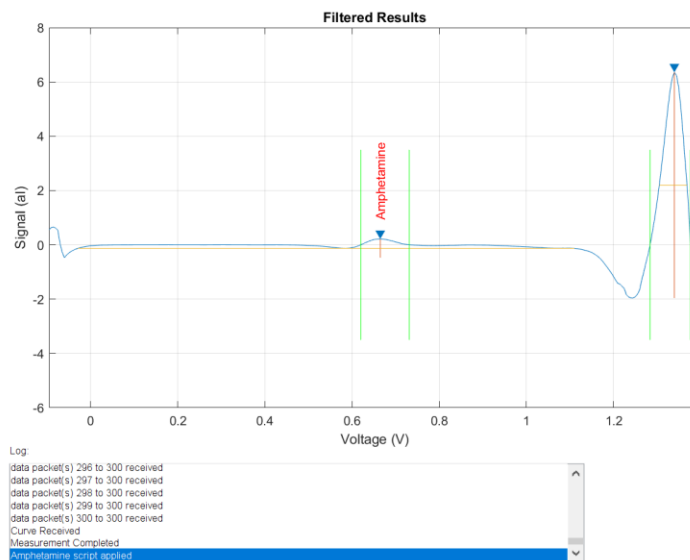
Measurement

- ☐ Cocaine measurement I
- ☐ Cocaine measurement II
- ☐ MDMA measurement
- ☐ MDMA/2-CB measurement
- ☐ Heroin measurement
- ☐ Ketamine measurement
- ☒ Amphetamine measurement
- ☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Amphetamine

Sample 36

Connect to device
EmStat3Blue [1] Disconnect Refresh


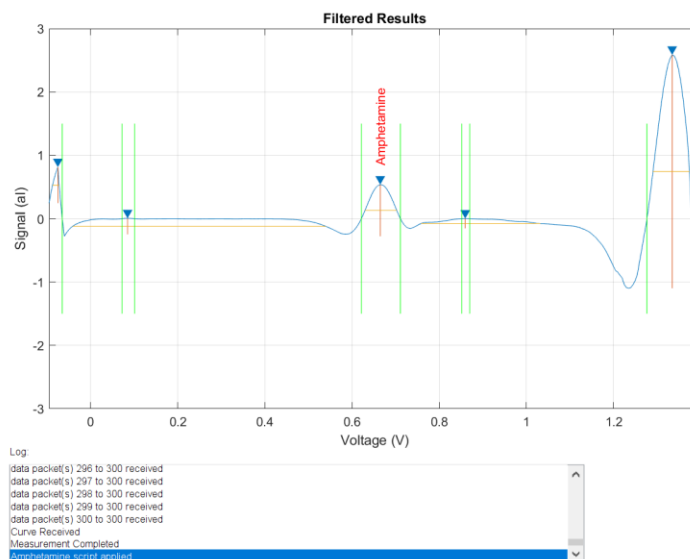
Measurement

- ☐ Cocaine measurement I
- ☐ Cocaine measurement II
- ☐ MDMA measurement
- ☐ MDMA/2-CB measurement
- ☐ Heroin measurement
- ☐ Ketamine measurement
- ☒ Amphetamine measurement
- ☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Amphetamine

Sample 37

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

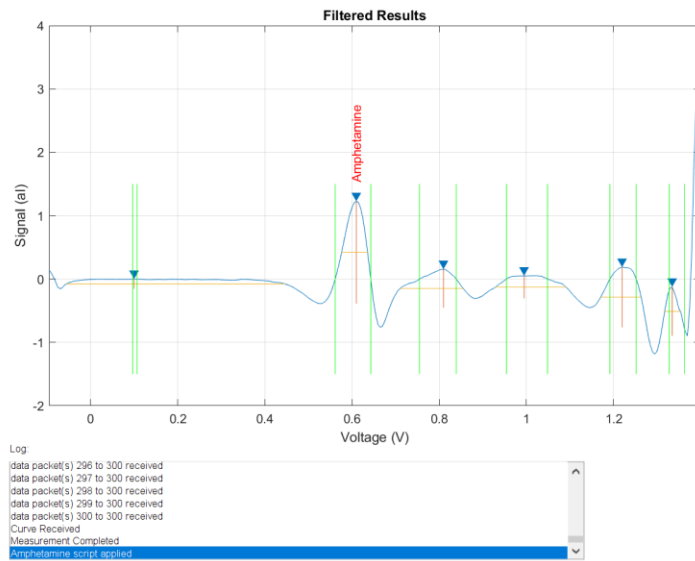
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☒ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Amphetamine





Sample 38

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

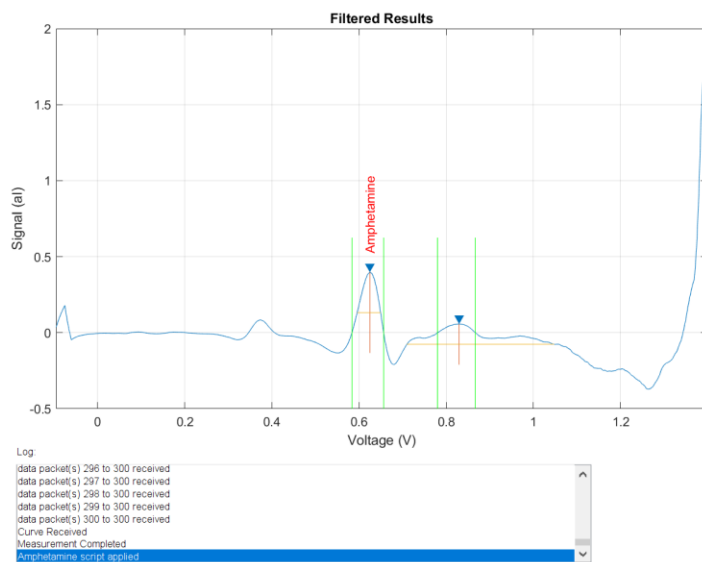
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☒ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Amphetamine





Sample 39

Connect to device
EmStat3Blue [1] Disconnect Refresh

Measurement

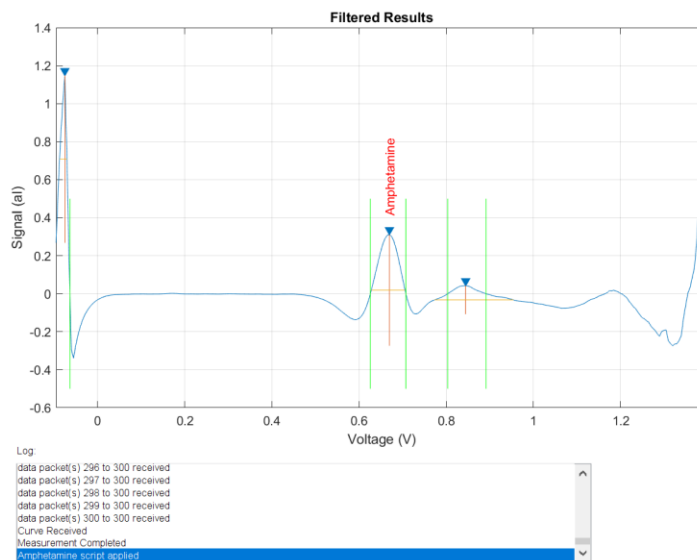
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☒ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Amphetamine





Sample 40

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

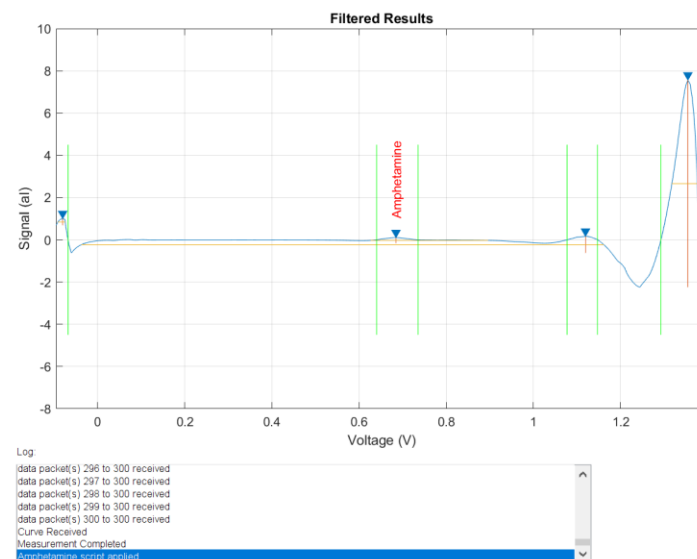
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☒ Amphetamine measurement
☐ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Amphetamine





Sample 41

Connect to device
 EmStat3Blue [1] Disconnect Refresh

Measurement

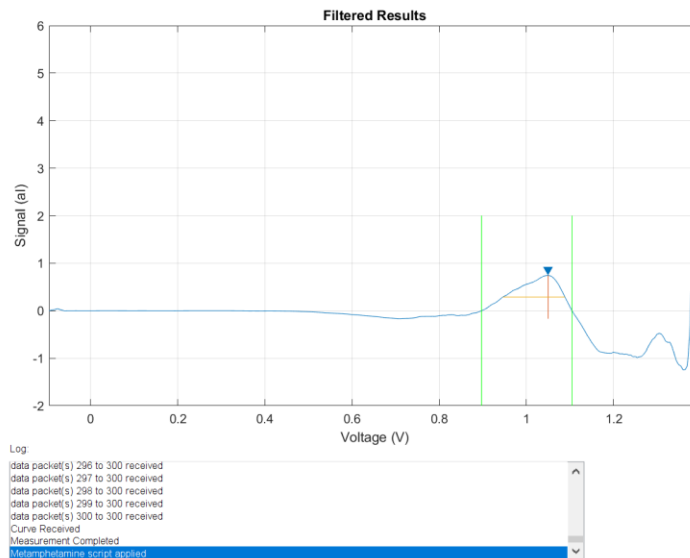
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☒ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:





Sample 42

Connect to device
 EmStat3Blue [1] Disconnect Refresh


Measurement

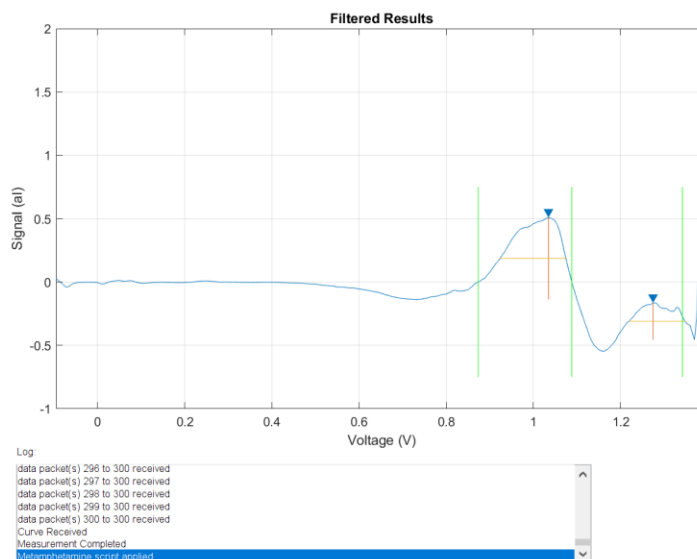
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☒ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:





Sample 43

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

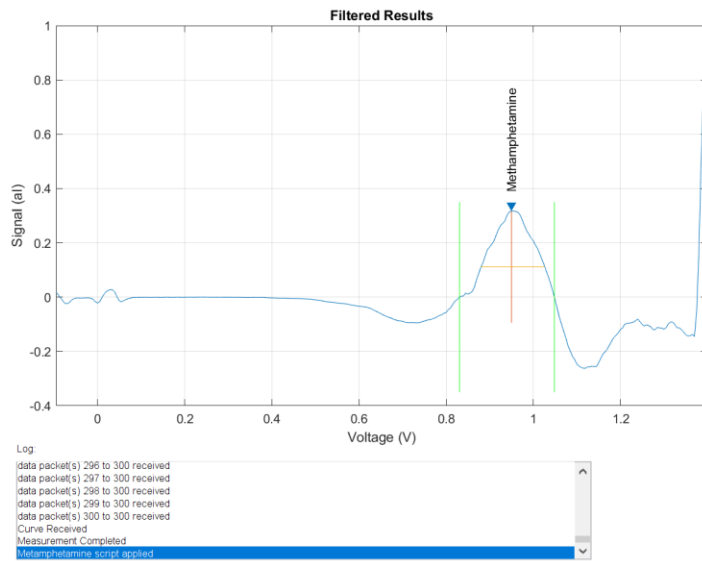
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☒ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Methamphetamine





Sample 44

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

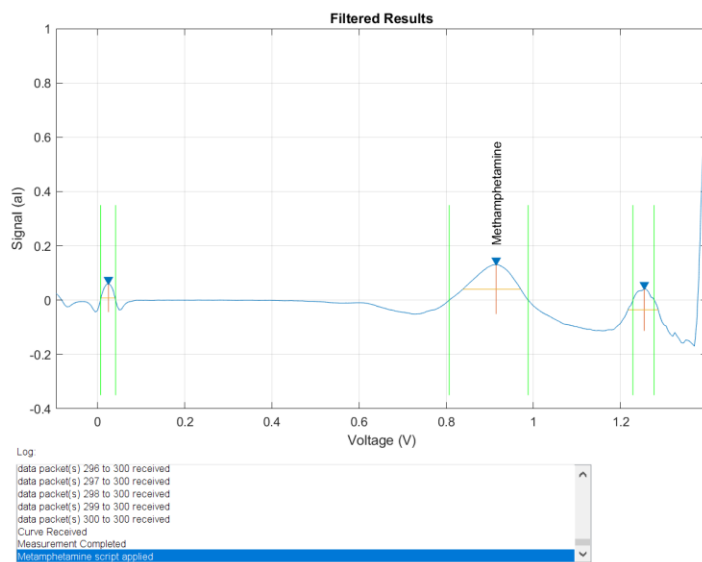
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☒ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Methamphetamine





Sample 45

Connect to device
EmStat3Blue [1] Disconnect Refresh


Measurement

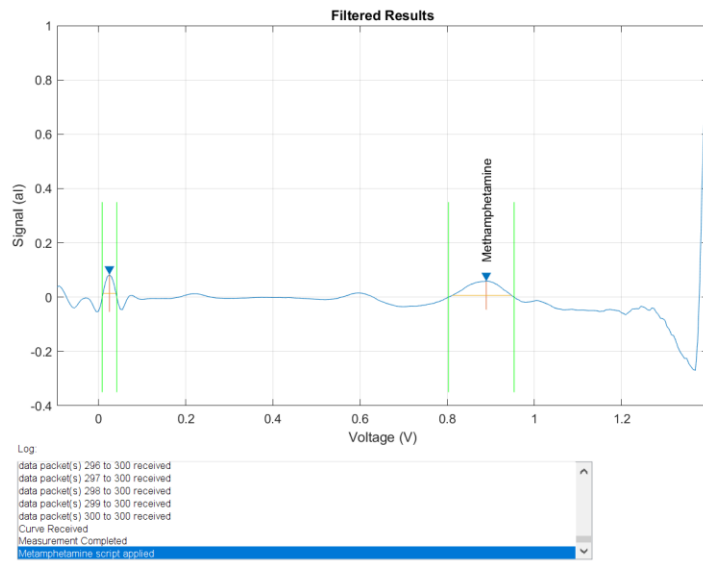
- ☐ Cocaine measurement I
- ☐ Cocaine measurement II
- ☐ MDMA measurement
- ☐ MDMA/2-CB measurement
- ☐ Heroin measurement
- ☐ Ketamine measurement
- ☐ Amphetamine measurement
- ☒ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Methamphetamine





Sample 46

Connect to device
EmStat3Blue [1] Disconnect Refresh

Measurement

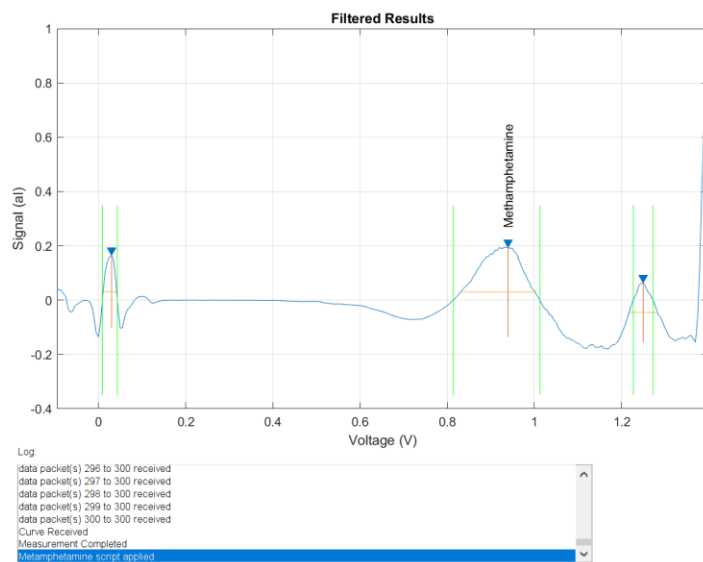
- ☐ Cocaine measurement I
- ☐ Cocaine measurement II
- ☐ MDMA measurement
- ☐ MDMA/2-CB measurement
- ☐ Heroin measurement
- ☐ Ketamine measurement
- ☐ Amphetamine measurement
- ☒ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Methamphetamine





Sample 47

Connect to device
EmStat3Blue [1] Disconnect Refresh

Measurement

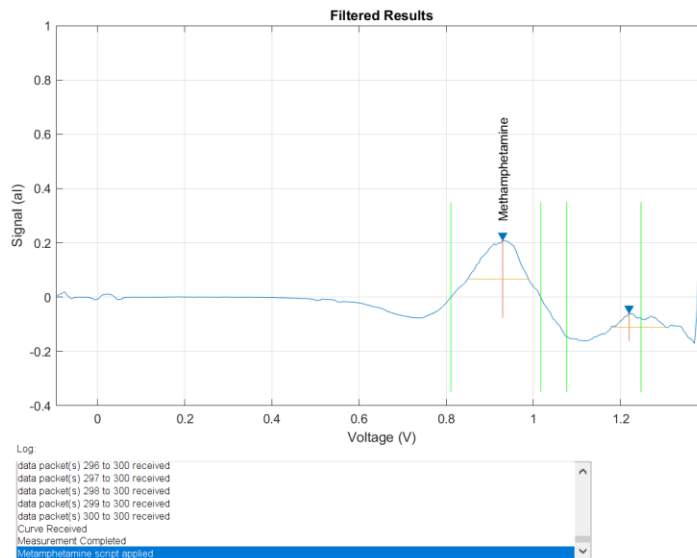
☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☒ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Methamphetamine





Sample 48

Connect to device
EmStat3Blue [1] Disconnect Refresh

Measurement

☐ Cocaine measurement I
☐ Cocaine measurement II
☐ MDMA measurement
☐ MDMA/2-CB measurement
☐ Heroin measurement
☐ Ketamine measurement
☐ Amphetamine measurement
☒ Methamphetamine measurement

Run measurement

Results of Measurement

Positive to:
Methamphetamine

