

Making money with Project Fugu

building a cash register
with web technologies

Hi, my name is
Niels Leenheer

@html5test

The logo for salonhub features two overlapping squares on the left: an orange square on top and a green square on the bottom. To the right of these squares, the word "salonhub" is written in a clean, black, lowercase sans-serif font.

salonhub



Not a real hairstylist



Not even
connected to
power



Just a random
expired
bank card



Not a real
customer



Inbox

Salonhub at Google I/O Connect - Hi Niels,

Project Fugu

Window Management

WebHID

WebBluetooth

Project Fugu

WebUSB

WebSerial

Oh, and could we do it in 4 weeks..

Two weeks later..

Employee: Stefan

| | |
|--|---------------|
| Womens Cut Full Finish | € 83,00 |
| Studio Line Remix Haarwax 150 ml | € 6,29 |
| Elvive Multivitamines 2-in-1 Shampoo 250 ml | € 5,39 |
| Total | € 94,68 |

Card Cash

Discount Points

Product

| | |
|--|---------------|
| Studio Line Remix Haarwax 150 ml | € 6,29 |
| Studio Line Invisi Fix 24h Gel 150 ml | € 5,79 |
| Elvive Multivitamines 2-in-1 Shampoo 250 ml | € 5,39 |
| Studio Line Invisi Fix Clean Sculpting Paste 75 ml | € 4,29 |

Price: 5,39

Amount: 1

Employee: Stefan

| | |
|--|---------------|
| Womens Cut Full Finish | € 83,00 |
| Studio Line Remix Haarwax 150 ml | € 6,29 |
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Price: 5,39

Amount: 1





Payment solutions

Web

Eats

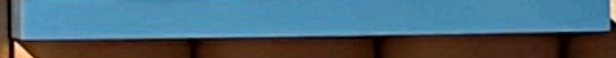
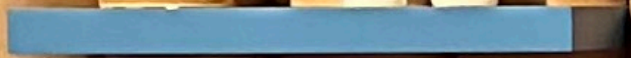
Angular classic games

JibeCity

Cloud

Connect





Demo

Demo

Building a cash register with web technologies



Receipt printer



```
let device = await navigator.usb.requestDevice({  
  filters: [ { vendorId: 0x04b8 } ]  
});
```

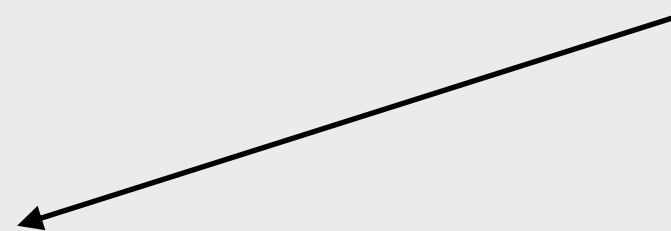
Seiko Epson Corp.



```
let device = await navigator.usb.requestDevice({  
  filters: { vendorId: 0x04b8 }  
});
```

```
await device.open();  
await device.claimInterface(0);  
await device.transferOut(1, payload);
```

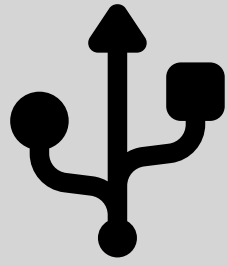
Interface



Endpoint

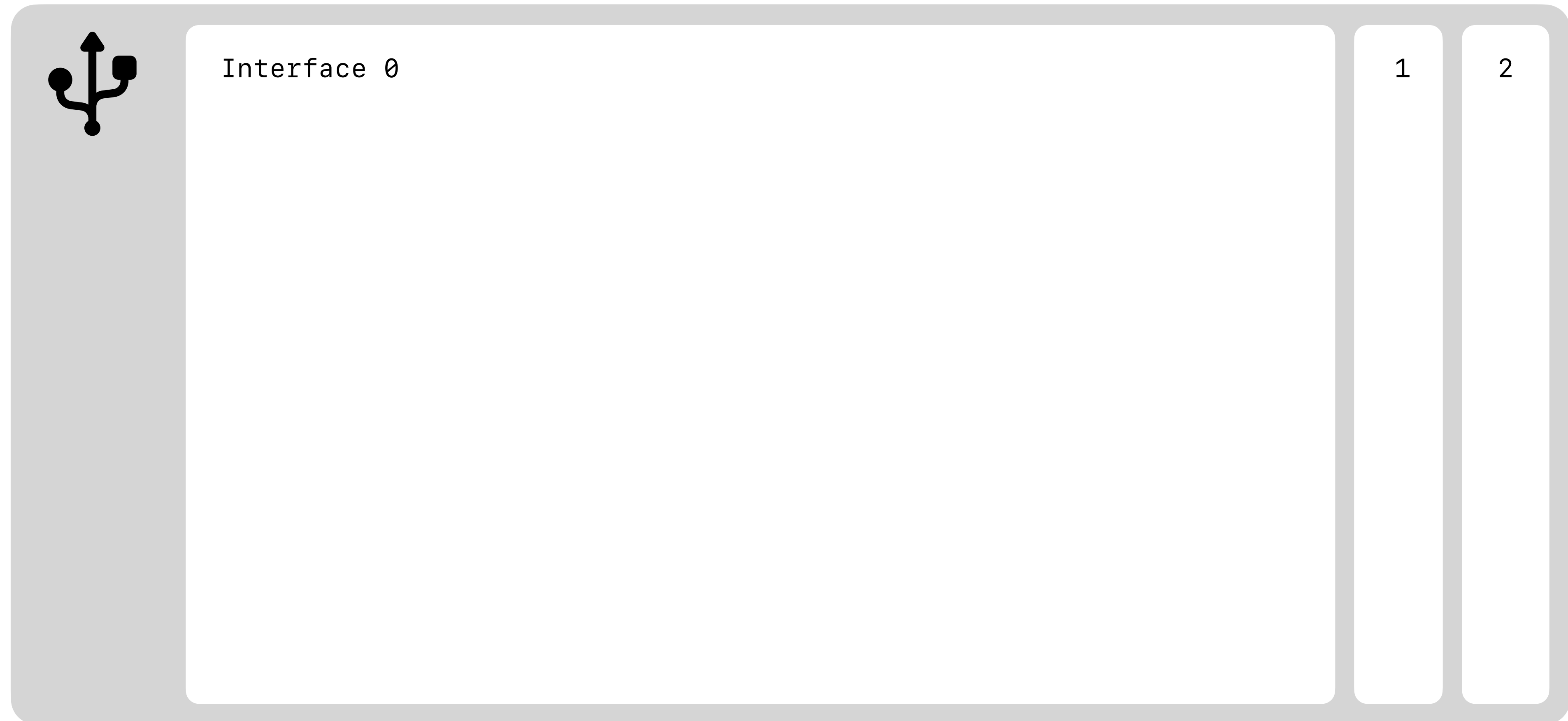
Endpoint? Inter...what?

USB device enumeration explained, the TL;DR version

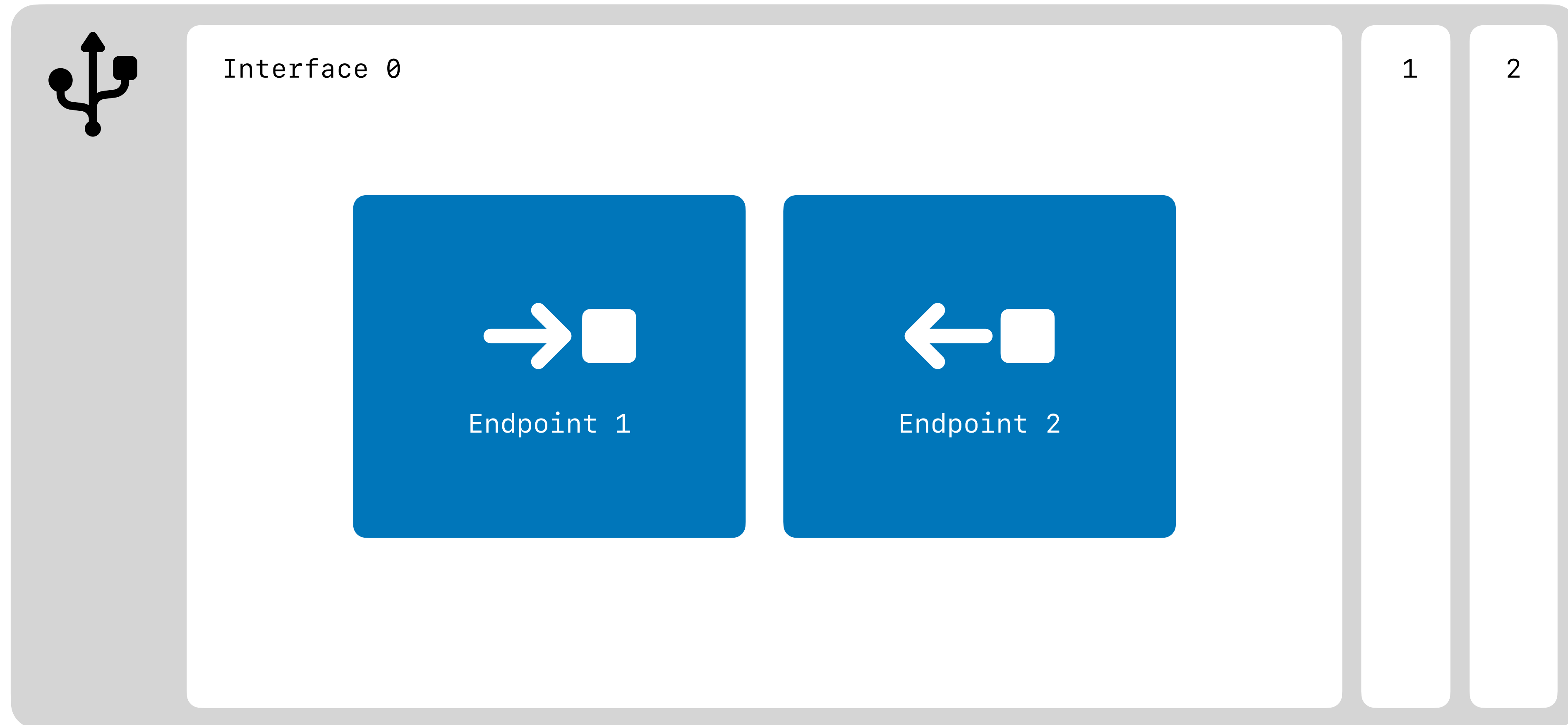


Interface 0

USB device enumeration explained, the TL;DR version



USB device enumeration explained, the TL;DR version





```
let device = await navigator.usb.requestDevice({  
  filters: { vendorId: 0x04b8 }  
});
```

```
await device.open();  
await device.claimInterface(0);  
await device.transferOut(1, payload);
```

Project Fugu allows us to talk to receipt printers,
but we still need to learn their language



```
import * as ReactDOM from 'react-dom';

const root = ReactDOM.createRoot(document.getElementById('root'));
const element = <div>
  <div>Welcome to</div>
  <div className="font-bold">HalfStack London</div>
</div>;

root.render(element);
```

Welcome to `
`

``HalfStack London``

Epson TM-930



ascii

| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | .A | .B | .C | .D | .E | .F |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|----|-----|
| 0. | NUL | SOH | STX | ETX | EOT | ENQ | ACK | BEL | BS | HT | LF | VT | FF | CR | SO | SI |
| 1. | DLE | DC1 | DC2 | DC3 | DC4 | NAK | SYN | ETB | CAN | EM | SUB | ESC | FS | GS | RS | US |
| 2. | | ! | " | # | \$ | % | & | ' | (|) | * | + | , | - | . | / |
| 3. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | : | ; | < | = | > | ? |
| 4. | @ | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| 5. | P | Q | R | S | T | U | V | W | X | Y | Z | [| \ |] | ^ | _ |
| 6. | ` | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
| 7. | p | q | r | s | t | u | v | w | x | y | z | { | | } | ~ | DEL |

ascii

| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | .A | .B | .C | .D | .E | .F |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|----|-----|
| 0. | NUL | SOH | STX | ETX | EOT | ENQ | ACK | BEL | BS | HT | LF | VT | FF | CR | SO | SI |
| 1. | DLE | DC1 | DC2 | DC3 | DC4 | NAK | SYN | ETB | CAN | EM | SUB | ESC | FS | GS | RS | US |
| 2. | | ! | " | # | \$ | % | & | ' | () | * | + | , | - | . | / | |
| 3. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | : | ; | < | = | > | ? |
| 4. | @ | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| 5. | P | Q | R | S | T | U | V | W | X | Y | Z | [| \ |] | ^ | _ |
| 6. | ` | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
| 7. | p | q | r | s | t | u | v | w | x | y | z | { | | } | ~ | DEL |




Welcome to ^{0A}
LF

HalfStack London ^{0A}
LF

ascii

| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | .A | .B | .C | .D | .E | .F |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|----|-----|
| 0. | NUL | SOH | STX | ETX | EOT | ENQ | ACK | BEL | BS | HT | LF | VT | FF | CR | SO | SI |
| 1. | DLE | DC1 | DC2 | DC3 | DC4 | NAK | SYN | ETB | CAN | EM | SUB | ESC | FS | GS | RS | US |
| 2. | | ! | " | # | \$ | % | & | ' | (|) | * | + | , | - | . | / |
| 3. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | : | ; | < | = | > | ? |
| 4. | @ | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| 5. | P | Q | R | S | T | U | V | W | X | Y | Z | [| \ |] | ^ | _ |
| 6. | ` | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
| 7. | p | q | r | s | t | u | v | w | x | y | z | { | | } | ~ | DEL |

Welcome to ^{0A} 

^{1B 45 01}  HalfStack London ^{1B 45 00}  ^{0A} 

Text formatting

| | | | |
|-----|---|---|---------------|
| ESC | E | n | Emphasis |
| ESC | 4 | n | Italic |
| ESC | - | n | Underline |
| GS | ! | n | Size |
| GS | B | n | Reverse print |
| ESC | M | n | Font |

Images and barcodes

| | | | | | | | | |
|-----|---|---|----|-----|---------|-------|-----|---------|
| GS | k | m | n | ... | Barcode | | | |
| GS | (| k | pL | pH | cn | fn | ... | QR code |
| ESC | * | m | nL | nH | ... | Image | | |

Layout

| | | | |
|-----|---|---|----------------|
| ESC | a | n | Text alignment |
|-----|---|---|----------------|

Welcome to ^{0A} **LF**

^{1B 45 01} **ESC E 1** HalfStack London ^{1B 45 00} **ESC E 0** ^{0A} **LF**

^{1D 56 00} **GS V 0**

1B 40
ESC @ Welcome to LF

1B 45 01
ESC E 1 HalfStack London
1B 45 00
ESC E 0 LF

1D 56 00
GS V 0

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But what about...

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LÅNGFJÄLL



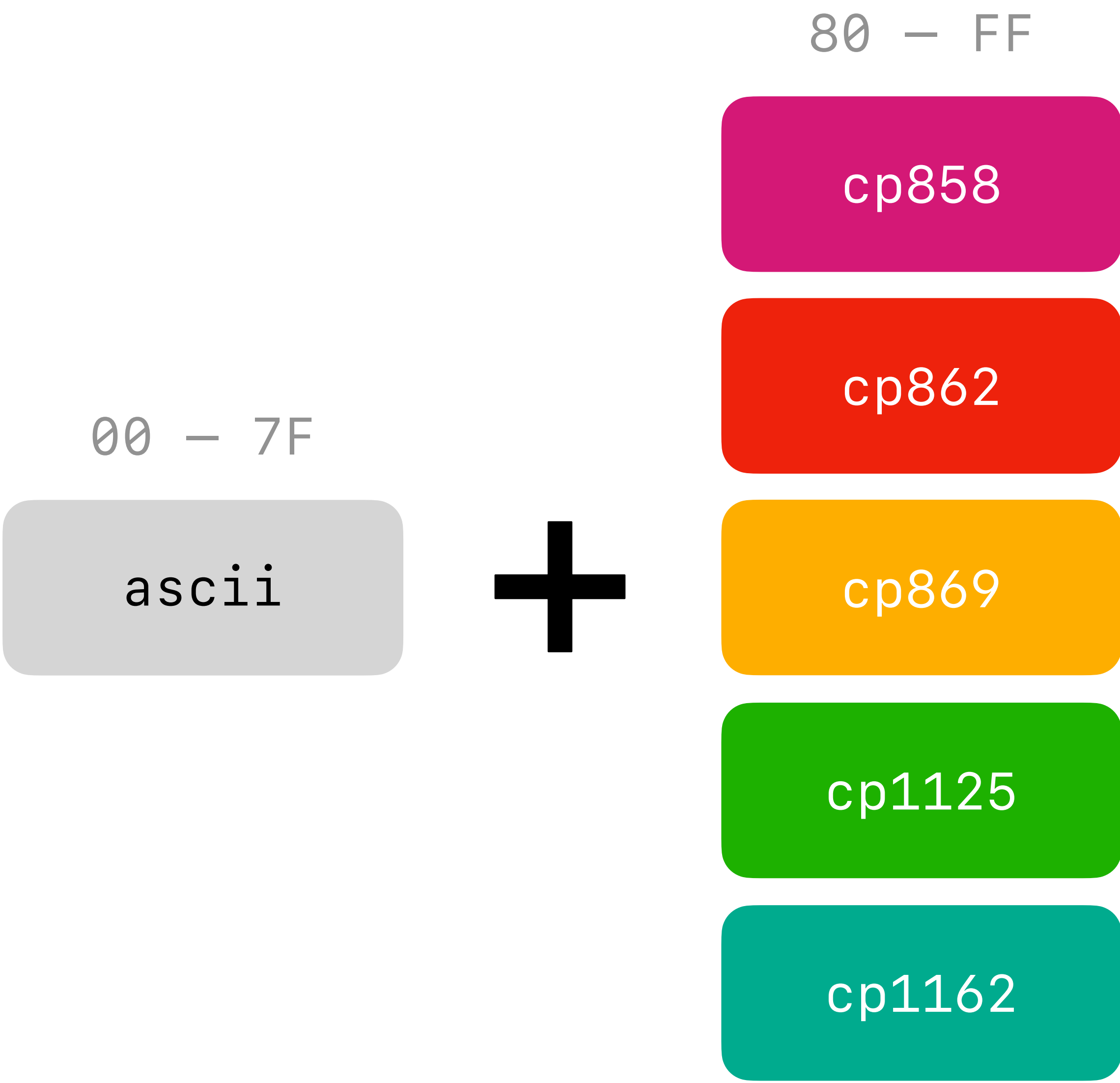
Internationalisation before Unicode

How can we sell computers to the rest
of the world with the least amount of effort
without actually dealing with the
actual complexities.

^{1B 40}
ESC @ Welcome to ^{0A}
LF
iñtërnâtiônàlizætìon ^{0A}
LF
before Unicode ^{0A}
LF
^{1D 56 00}
GS V 0

ascii

| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | .A | .B | .C | .D | .E | .F |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|----|----|-----|
| 0. | NUL | SOH | STX | ETX | EOT | ENQ | ACK | BEL | BS | HT | LF | VT | FF | CR | SO | SI |
| 1. | DLE | DC1 | DC2 | DC3 | DC4 | NAK | SYN | ETB | CAN | EM | SUB | ESC | FS | GS | RS | US |
| 2. | | ! | " | # | \$ | % | & | ' | (|) | * | + | , | - | . | / |
| 3. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | : | ; | < | = | > | ? |
| 4. | @ | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| 5. | P | Q | R | S | T | U | V | W | X | Y | Z | [| \ |] | ^ | _ |
| 6. | ` | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
| 7. | p | q | r | s | t | u | v | w | x | y | z | { | | } | ~ | DEL |



cp858

| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | .A | .B | .C | .D | .E | .F |
|----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|------|
| 8. | Ç | ü | é | â | ä | à | å | ç | ê | ë | è | ï | î | ì | Ä | Å |
| 9. | É | æ | Æ | ô | ö | ò | û | ù | ÿ | Ö | Ü | ø | £ | Ø | × | f |
| A. | á | í | ó | ú | ñ | Ñ | ª | º | ¿ | ® | ¬ | ½ | ¼ | ¡ | « | » |
| B. | ■ | ■ | ■ | | ┌ | Á | Â | À | © | ≡ | | ⌋ | ⌌ | ¢ | ¥ | └ |
| C. | L | ┌ | ┐ | └ | — | + | ã | Ã | ⌋ | ⌌ | ≡ | ≡ | ≡ | ≡ | ≡ | ⌘ |
| D. | ř | Đ | Ê | Ë | È | € | Í | Î | Ï | └ | ┌ | ■ | ■ | ! | ì | ■ |
| E. | Ó | β | Ô | Ò | õ | Õ | μ | þ | Ɔ | Ú | Û | Ù | ý | Ý | - | ' |
| F. | SHY | ± | = | ¾ | ¶ | § | ÷ | , | ° | ¨ | . | 1 | 3 | 2 | ■ | NBSP |

cp862

| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | .A | .B | .C | .D | .E | .F |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|------|
| 8. | א | ב | ג | ד | ה | ו | ז | ח | ט | י | ך | כ | ל | ם | מ | ן |
| 9. | נ | ס | ע | ף | פ | ץ | צ | ק | ר | ש | ת | ¢ | £ | ¥ | ₪ | f |
| A. | á | í | ó | ú | ñ | Ñ | ª | º | ¿ | ® | ¬ | ½ | ¼ | ¡ | « | » |
| B. | ▒ | ░ | ▣ | | ┌ | Á | Â | À | © | ≡ | | ⌋ | ⌌ | ¢ | ¥ | ¬ |
| C. | L | ┌ | ┐ | └ | — | + | ã | Ã | ⌌ | ⌋ | ≡ | ≡ | ≡ | ≡ | ≡ | ≡ |
| D. | ≡ | ≡ | ≡ | ⌌ | ⌋ | ≡ | ≡ | ≡ | ≡ | ⌋ | ⌌ | ■ | ■ | ■ | ■ | ■ |
| E. | α | β | Γ | π | Σ | σ | μ | τ | Φ | Θ | Ω | δ | ∞ | φ | ε | ∩ |
| F. | ≡ | ± | ≥ | ≤ | ∫ | J | ÷ | ≈ | ◦ | • | · | √ | n | ² | ■ | NBSP |

cp869

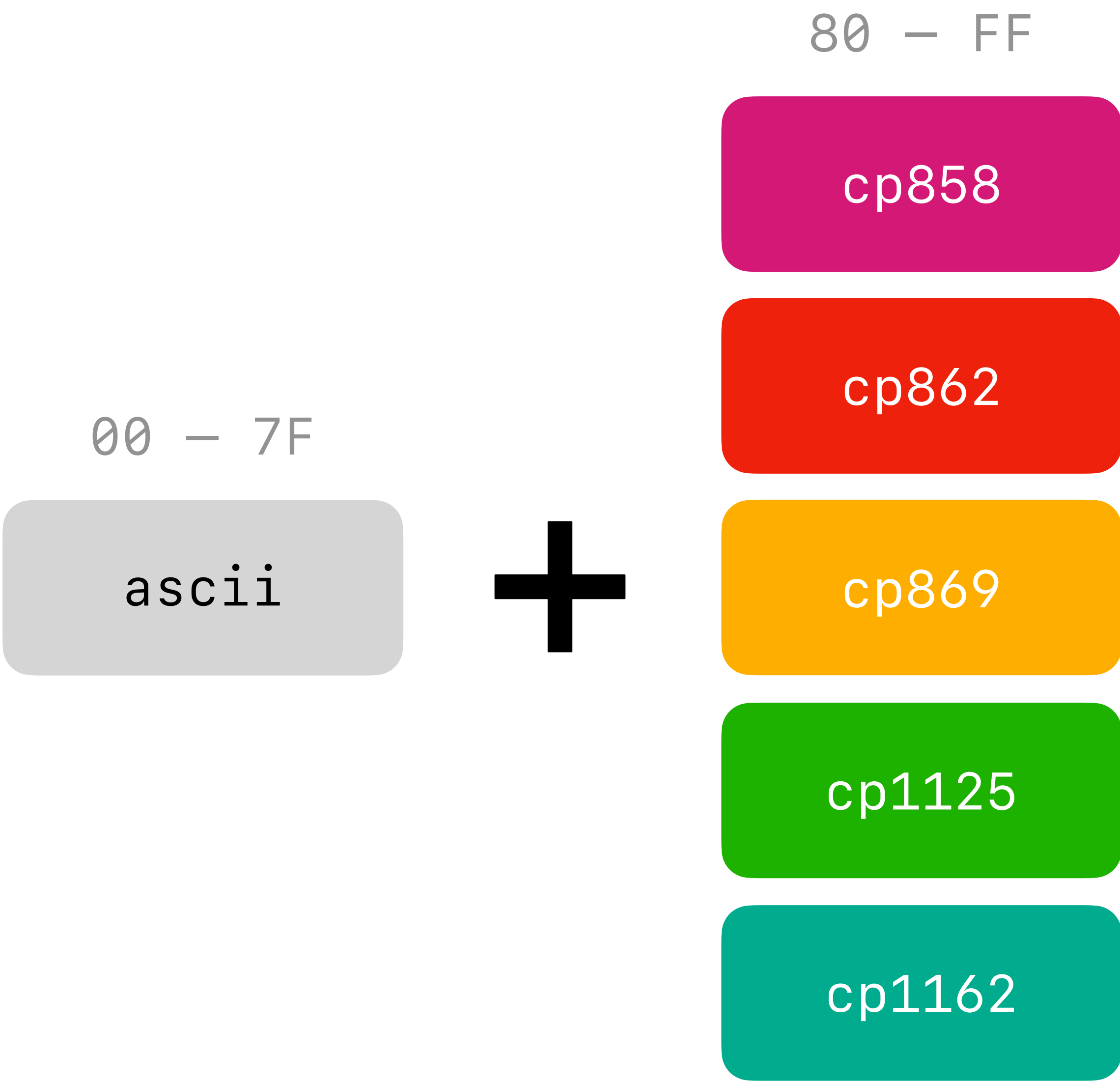
| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | .A | .B | .C | .D | .E | .F |
|----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|------|
| 8. | | | | | | | À | € | · | ¬ | ¡ | ' | ' | Έ | — | Ή |
| 9. | ı | ï | Ό | | | Υ | ÿ | © | Ω | ² | ³ | ά | £ | έ | ή | ί |
| A. | ï | ï | ό | ύ | Α | Β | Γ | Δ | Ε | Ζ | Η | ½ | Θ | Ι | « | » |
| B. | | | | | ⊥ | Κ | Λ | Μ | Ν | ≡ | | ⊥ | ⊥ | ≡ | Ο | ¬ |
| C. | ⊥ | ⊥ | ⊥ | ⊥ | — | + | Π | Ρ | ⊥ | ⊥ | ≡ | ≡ | ⊥ | ≡ | ≡ | Σ |
| D. | Τ | Υ | Φ | Χ | Ψ | Ω | α | β | γ | ⊥ | ⊥ | | | δ | ε | |
| E. | ζ | η | θ | ι | κ | λ | μ | ν | ξ | ο | π | ρ | σ | ς | τ | ' |
| F. | SHY | ± | υ | φ | χ | ξ | ψ | “ | ◦ | “ | ω | ü | ÿ | ώ | | NBSP |

cp1125

| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | .A | .B | .C | .D | .E | .F |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|------|
| 8. | А | Б | В | Г | Д | Е | Ж | З | И | Й | К | Л | М | Н | О | П |
| 9. | Р | С | Т | У | Ф | Х | Ц | Ч | Ш | Щ | Ъ | Ы | Ь | Э | Ю | Я |
| A. | а | б | в | г | д | е | ж | з | и | й | к | л | м | н | о | п |
| B. | | | | | ┌ | ≠ | ┐ | └ | ≠ | | ┐ | ┌ | ┐ | ≠ | └ | |
| C. | └ | ┌ | ┐ | └ | — | + | ≠ | ┐ | ┌ | ≠ | ≠ | ≠ | ≠ | ≠ | ≠ | ≠ |
| D. | ≠ | ≠ | ≠ | ┌ | ┐ | ≠ | ┐ | ≠ | ≠ | ┐ | └ | ■ | ■ | ■ | ■ | ■ |
| E. | р | с | т | у | ф | х | ц | ч | ш | щ | ъ | ы | ь | э | ю | я |
| F. | Ё | ё | Г | г | Є | є | І | і | Ї | ї | · | √ | Nº | Ɱ | ■ | NBSP |

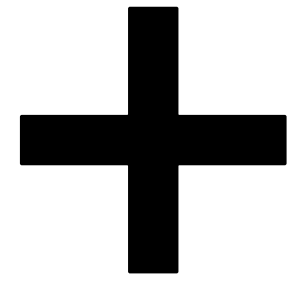
cp1162

| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | .A | .B | .C | .D | .E | .F |
|----|----|----|----|----|----|-----|----|----|----|----|----|----|----|----|----|------|
| 8. | € | | | | | ... | | | | | | | | | | |
| 9. | | ' | ' | " | " | . | - | — | | | | | | | | |
| A. | ̀ | ก | ข | ช | ค | ค | ฃ | ง | จ | ฉ | ช | ช | ฅ | ญ | ฎ | ฏ |
| B. | ฐ | ท | ฒ | ณ | ด | ต | ถ | ท | ธ | น | บ | ป | ผ | ฝ | พ | ฟ |
| C. | ภ | ม | ย | ร | ฤ | ล | ภ | ว | ศ | ษ | ส | ห | ฬ | อ | ฮ | ฯ |
| D. | ๕ | ั | า | ำ | ิ | ี | ึ | ุ | ู | ุ | ็ | ๋ | ้ | ๊ | ๋ | ฿ |
| E. | เ | แ | โ | ใ | ไ | า | ฯ | ั | ็ | ๋ | ็ | ้ | ๊ | ๋ | ็ | ๐ |
| F. | ๐ | ๑ | ๒ | ๓ | ๔ | ๕ | ๖ | ๗ | ๘ | ๙ | ฯ | ☛ | ¢ | ↳ | ¦ | NBSP |



00 - 7F

ascii



| | | | | |
|-------|--------|--------|-----------|-------------|
| cp437 | cp860 | cp1119 | cp3841 | rk1048 |
| cp720 | cp861 | cp1125 | cp3843 | windows1250 |
| cp737 | cp862 | cp1162 | cp3844 | windows1251 |
| cp775 | cp863 | cp2001 | cp3845 | windows1252 |
| cp850 | cp864 | cp3001 | cp3846 | windows1253 |
| cp851 | cp865 | cp3002 | cp3847 | windows1254 |
| cp852 | cp866 | cp3011 | cp3848 | windows1255 |
| cp853 | cp869 | cp3012 | iso88591 | windows1256 |
| cp855 | cp874 | cp3021 | iso88592 | windows1257 |
| cp857 | cp1098 | cp3041 | iso88597 | windows1258 |
| cp858 | cp1118 | cp3840 | iso885915 | |

^{1B 40} ESC ^{1B 74} ESC t n=cp858 Welcome to ^{0A} LF

iñtërnâtiônàlizætión ^{0A} LF

before Unicode ^{0A} LF

^{1D 56 00} GS V 0

U+00F1
↓
A4

U+00E2
↓
83

U+00E0
↓
85

U+00F8
↓
9B

iñtërnâtiônàlizætìon

U+00EB
↓
89

U+00F4
↓
93

U+00E6
↓
91

CodepageEncoder

<https://github.com/NielsLeenheer/CodepageEncoder>



```
import CodepageEncoder from 'codepage-encoder';  
CodepageEncoder.encode('Iñtërnâtiônàlizætìon before Unicode', 'cp858');
```

```
Uint8Array(33) [  
  73, 164, 116, 137, 114, 110, 131,  
 116, 105, 147, 110, 133, 108, 105,  
 122, 145, 116, 105, 155, 110, 32,  
 98, 101, 102, 111, 114, 101, 32,  
 85, 110, 105, 99, 111, 100, 101  
]
```



Epson TM-88IV

| | | | | | | | | | |
|----|-------|----|--------|----|--------|----|-----------|-------------|-------------|
| 00 | cp437 | 03 | cp860 | 2b | cp1119 | | 35 | rk1048 | |
| 20 | cp720 | 23 | cp861 | 2c | cp1125 | | 2d | windows1250 | |
| 0e | cp737 | 24 | cp862 | | | | 2e | windows1251 | |
| 21 | cp775 | 04 | cp863 | | | | 10 | windows1252 | |
| 02 | cp850 | 25 | cp864 | | | | 2f | windows1253 | |
| 0b | cp851 | 05 | cp865 | | | | 30 | windows1254 | |
| 12 | cp852 | 11 | cp866 | | | | 31 | windows1255 | |
| 0c | cp853 | 26 | cp869 | | | | 32 | windows1256 | |
| 22 | cp855 | | | | | 27 | iso88592 | 33 | windows1257 |
| 0d | cp857 | 29 | cp1098 | | | 0f | iso88597 | 34 | windows1258 |
| 13 | cp858 | 2a | cp1118 | | | 28 | iso885915 | | |



Bixolon SRP-350III

| | | | | | | |
|-----------|-------|-----------|-------|--|--|--|
| 00 | cp437 | 03 | cp860 | | | |
| | | | | | | |
| | | | | | | |
| | | 04 | cp863 | | | |
| 02 | cp850 | | | | | |
| 0b | cp851 | 05 | cp865 | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| 13 | cp858 | | | | | |



Zjiang ZJ-5805

| | | | | | | | | | |
|----|-------|----|--------|----|--------|----|--------|----|-------------|
| 00 | cp437 | 03 | cp860 | 44 | cp1119 | | | | |
| 5d | cp720 | 38 | cp861 | | | 4c | cp3843 | 48 | windows1250 |
| 40 | cp737 | 3e | cp862 | | | 4d | cp3844 | 49 | windows1251 |
| 5f | cp775 | 04 | cp863 | 53 | cp2001 | 4e | cp3845 | 10 | windows1252 |
| 02 | cp850 | 3f | cp864 | 54 | cp3001 | 4f | cp3846 | 5a | windows1253 |
| 41 | cp851 | 05 | cp865 | 55 | cp3002 | 50 | cp3847 | 5b | windows1254 |
| 12 | cp852 | 11 | cp866 | 56 | cp3011 | 51 | cp3848 | 20 | windows1255 |
| | | 42 | cp869 | 57 | cp3012 | | | 5c | windows1256 |
| 3c | cp855 | | | 58 | cp3021 | | | | |
| 3d | cp857 | | | 59 | cp3041 | | | 5e | windows1258 |
| 13 | cp858 | 45 | cp1118 | 4a | cp3840 | | | | |



Citizen CTS-310II

| | | | | | | | |
|----|-------|----|-------|--|--|----|-------------|
| 00 | cp437 | 03 | cp860 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | 04 | cp863 | | | 10 | windows1252 |
| 02 | cp850 | 28 | cp864 | | | | |
| | | 05 | cp865 | | | | |
| 12 | cp852 | 11 | cp866 | | | | |
| | | | | | | | |
| | | | | | | | |
| 08 | cp857 | | | | | | |
| 13 | cp858 | | | | | | |



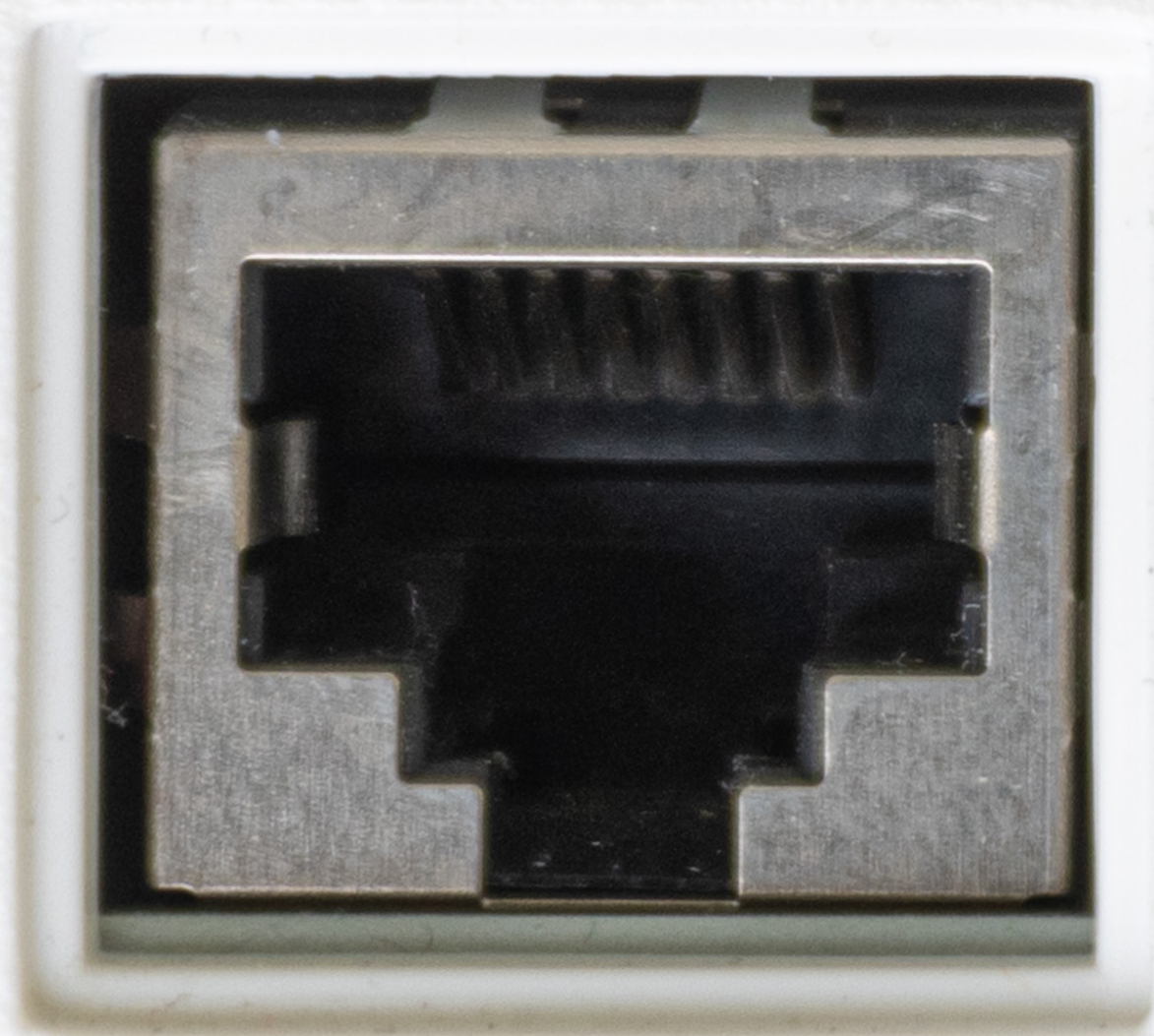
Cash drawer

Send a pulse
to the DK port

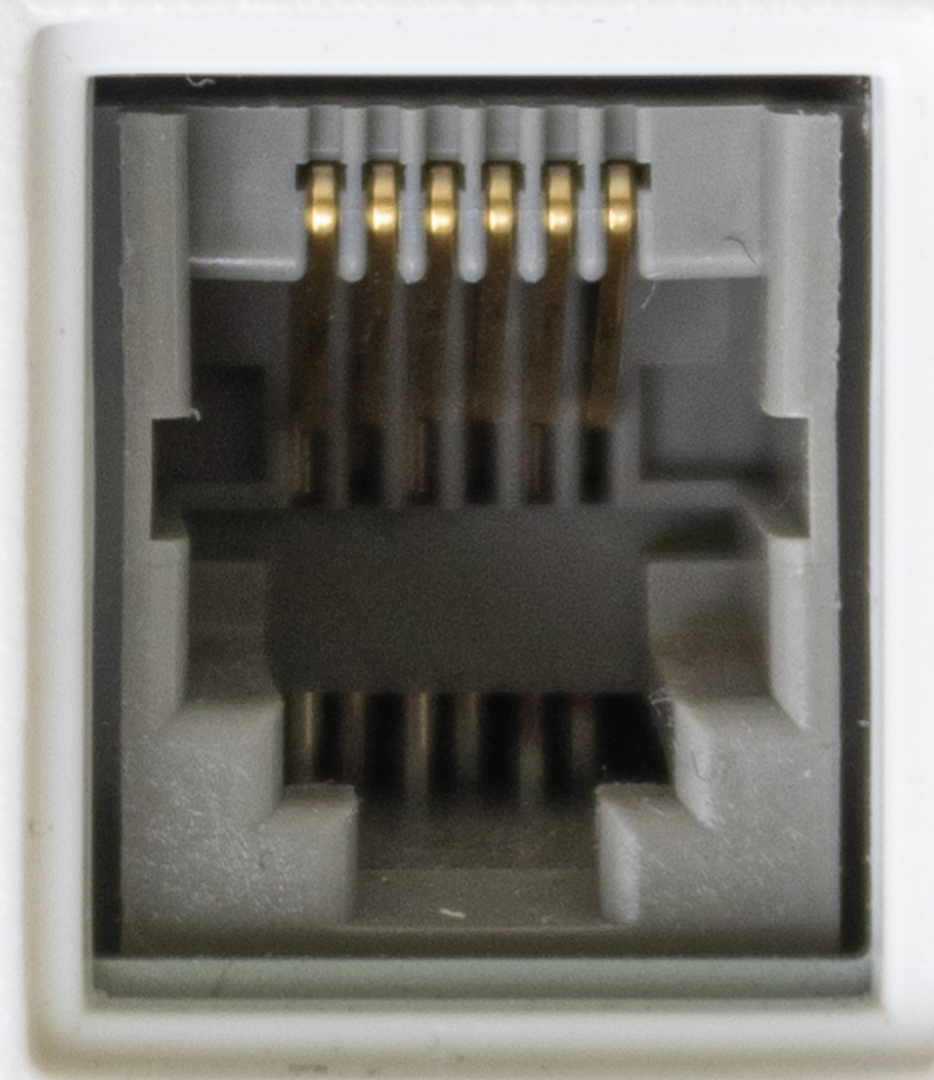
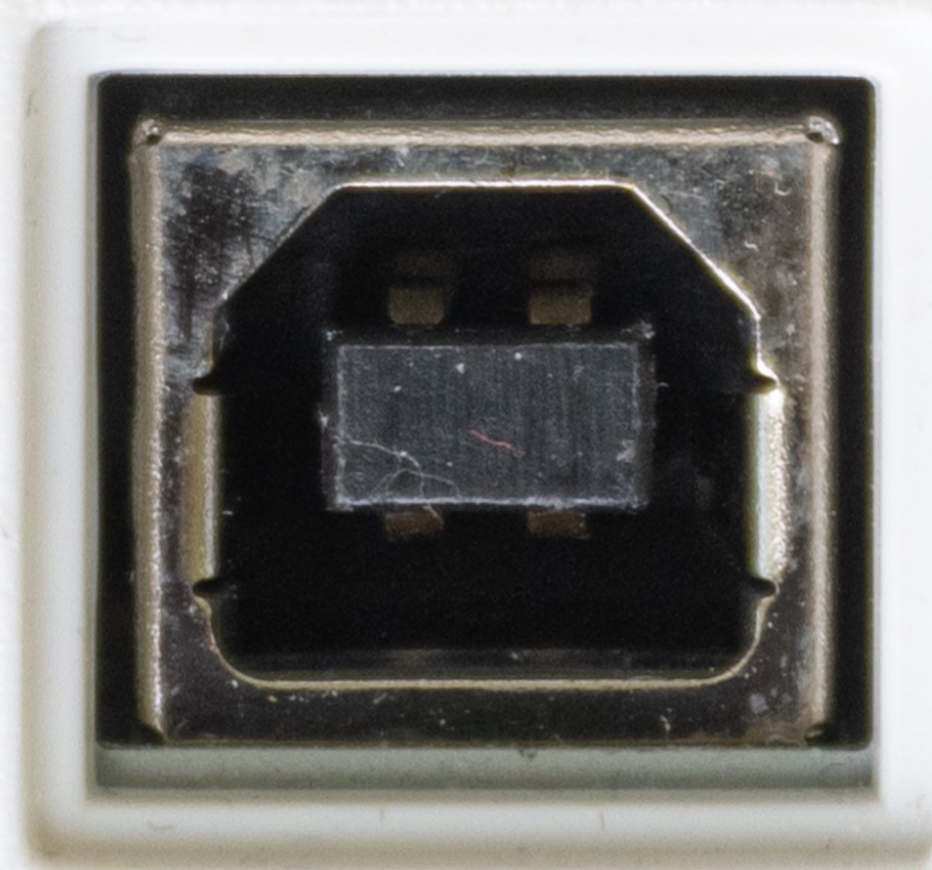
ESC | p | m | t1 | t2



RESET



LAN



DK Δ



DC24V

EscPosEncoder

<https://github.com/NielsLeenheer/EscPosEncoder>



```
import EscPosEncoder from 'esc-pos-encoder.esm.js';

let encoder = new EscPosEncoder();
let payload = encoder
  .initialize()
  .text('Welcome to').newline()
  .bold().text('HalfStack London').bold().newline()
  .cut()
  .encode();

// To do: Send the contents of payload to the printer
```

But wait...



salonhub

De Millijstraat 7
9471 AG Zuidlaren
The Netherlands

www.salonhub.nl
info@salonhub.nl

Date: 2-9-2023 11:58:02
Employee: Stefan

| | |
|---------------------------|----------|
| Womens Cut Full | € 83,00 |
| Finish | |
| Blowdry | € 57,00 |
| E vive Multivitamines 250 | |
| m1 | |
| 2-in-1 Shampoo 250 | € 5,39 |
| ===== | |
| Total | € 145,39 |

Thanks for your interest in
this demo! Enjoy your time
here at Google I/O Connect!

StarPRNT - pretty much the same as ESC/POS,
except all the escape commands and codepages are different.

1B 40 **1B 74 13** **0A**
ESC @ ESC t n=cp858 Welcome to LF

1B 45 01 **1B 45 00** **0A**
ESC E 1 HalfStack London ESC E 0 LF

1D 56 00
GS V 0

1B 40 18
ESC @ CAN

1B 74 13
ESC t n=cp858

Welcome to LF

1B 45 01
ESC E 1

HalfStack London

1B 45 00 0A
ESC E 0 LF

1D 56 00
GS V 0

1B 40 18
ESC | @ | CAN

1B 1D 74 04
ESC | GS | t | n=cp858

Welcome to LF

1B 45 01
ESC | E | 1

HalfStack London

1B 45 00 0A
ESC | E | 0 LF

1D 56 00
GS | V | 0

1B 40 18
ESC @ CAN

1B 1D 74 04
ESC GS t n=cp858

Welcome to LF

1B 45
ESC E

HalfStack London

1B 46
ESC F

0A
LF

1D 56 00
GS V 0

1B 40 18
ESC @ CAN

1B 1D 74 04
ESC GS t n=cp858

Welcome to LF

1B 45
ESC E

HalfStack London

1B 46
ESC F

0A
LF

1B 64 00
ESC d 0

StarPrntEncoder

<https://github.com/NielsLeenheer/StarPrntEncoder>

StarPrntEncoder

<https://github.com/NielsLeenheer/StarPrntEncoder>

Receipt printers are a big mess





ThermalPrinterEncoder

<https://github.com/NielsLeenheer/ThermalPrinterEncoder>



```
import ThermalPrinterEncoder from 'thermal-printer-encoder.esm.js';

let encoder = new ThermalPrinterEncoder({
  language: 'esc-pos',
  codepageMapping: 'epson'
});

let payload = encoder
  .initialize()
  .text('Welcome to').newline()
  .bold().text('HalfStack London').bold().newline()
  .cut()
  .encode();
```



```
let encoder = new ThermalPrinterEncoder({
  language: 'esc-pos',
  codepageMapping: 'epson'
});

let payload = encoder
  .initialize()
  .text('Welcome to').newline()
  .bold().text('HalfStack London').bold().newline()
  .cut()
  .encode();

// To do: Send the contents of payload to the printer
```

WebUSBReceiptPrinter

<https://github.com/NielsLeenheer/WebUSBReceiptPrinter>



```
import WebUSBReceiptPrinter from 'webusb-receipt-printer.esm.js';

const receiptPrinter = new WebUSBReceiptPrinter();
await receiptPrinter.connect();

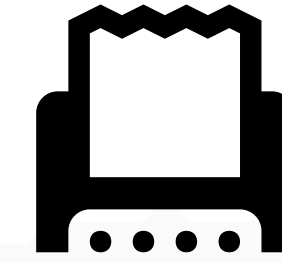
/* Send the contents of payload to the printer */
receiptPrinter.print(payload);
```

WebSerialReceiptPrinter

<https://github.com/NielsLeenheer/WebSerialReceiptPrinter>

WebBluetoothReceiptPrinter

<https://github.com/NielsLeenheer/WebBluetoothReceiptPrinter>



Connect with WebUSB



Connect with WebSerial



Connect with WebBluetooth

Receipt width



32 characters

35 characters

A black rectangular digital display sign is mounted on a white cylindrical stand. The sign's screen shows the text "Welcome to Salonhub" in a green, pixelated font. The background is a bright, out-of-focus window with a vase of dried branches on a table.

Welcome to
Salonhub

Customer display

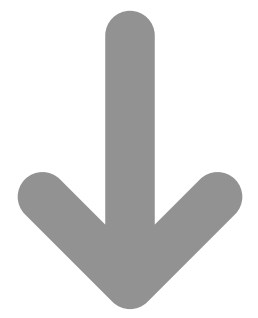
What language do customer displays speak?



FL L2 94Y-0 2 129

1B 40

ESC @



1B 3D 0

ESC = 0

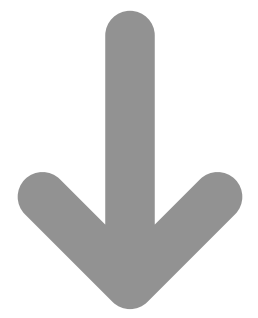
1B 3D 1

ESC = 1



1B 40

ESC @



1B 3D 0

ESC = 0

1B 3D 1

ESC = 1





```
let port = await navigator.serial.requestPort();
```



```
let port = await navigator.serial.requestPort();
```

```
  await port.open({  
    baudRate: 9600  
  });
```



```
let port = await navigator.serial.requestPort();
```

```
  await port.open({  
    baudRate: 9600  
  });
```

```
let writer = port.writable.getWriter();  
await writer.write(payload);
```




FL L2 54Y-0 2 129



But wait...

Let's talk about USB device classes




ADC



CDC



HID



MSC



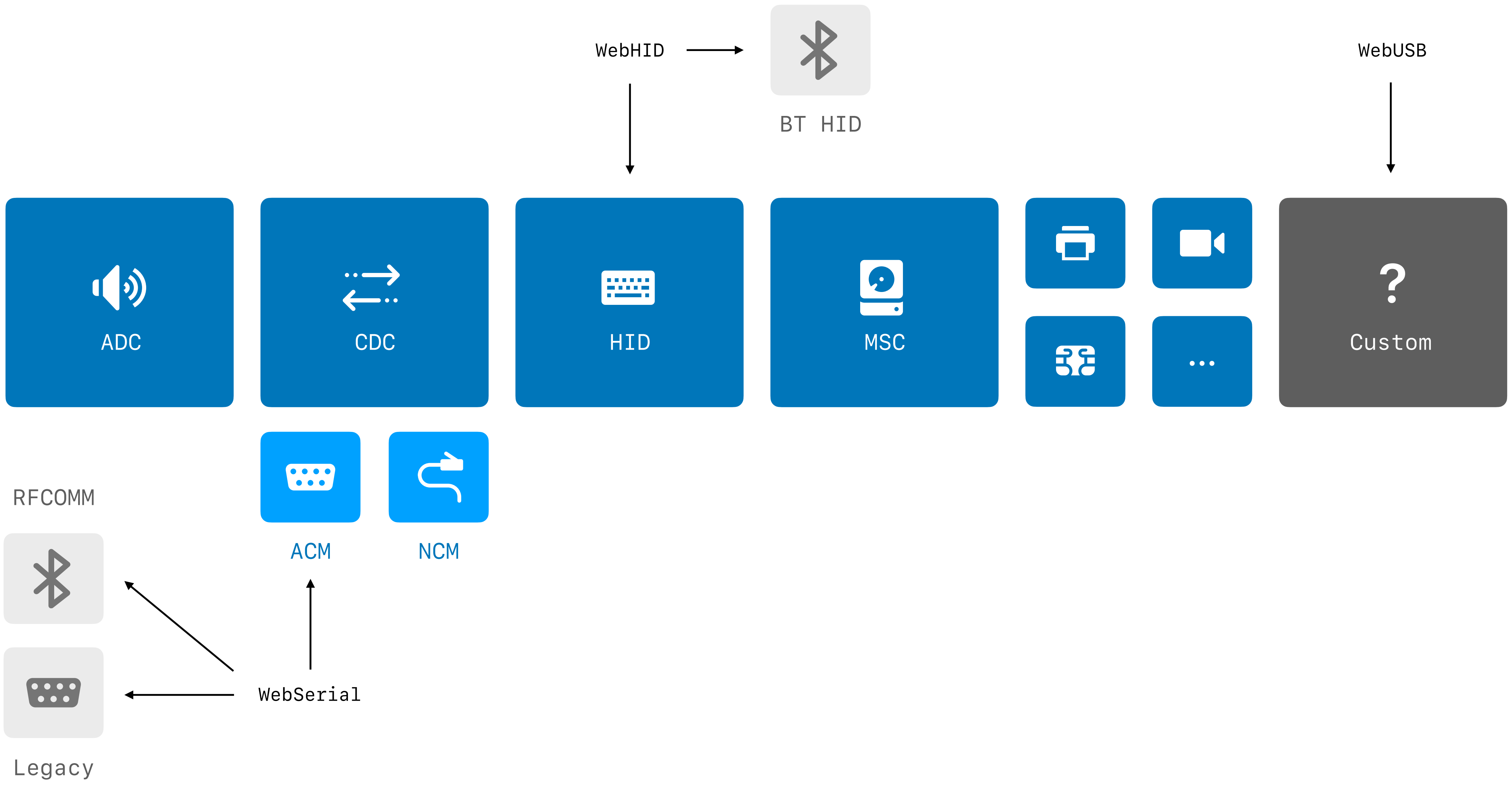
Custom

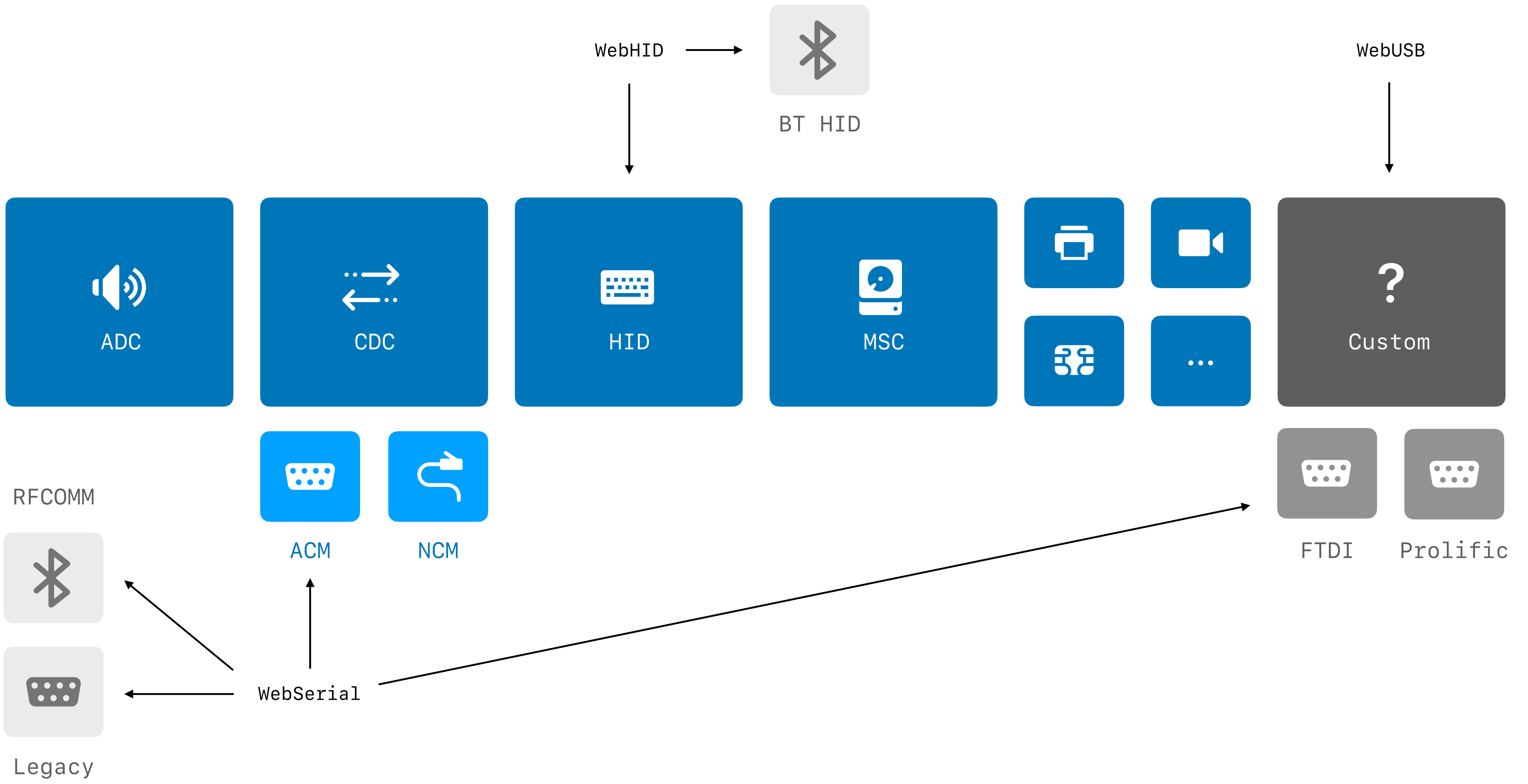


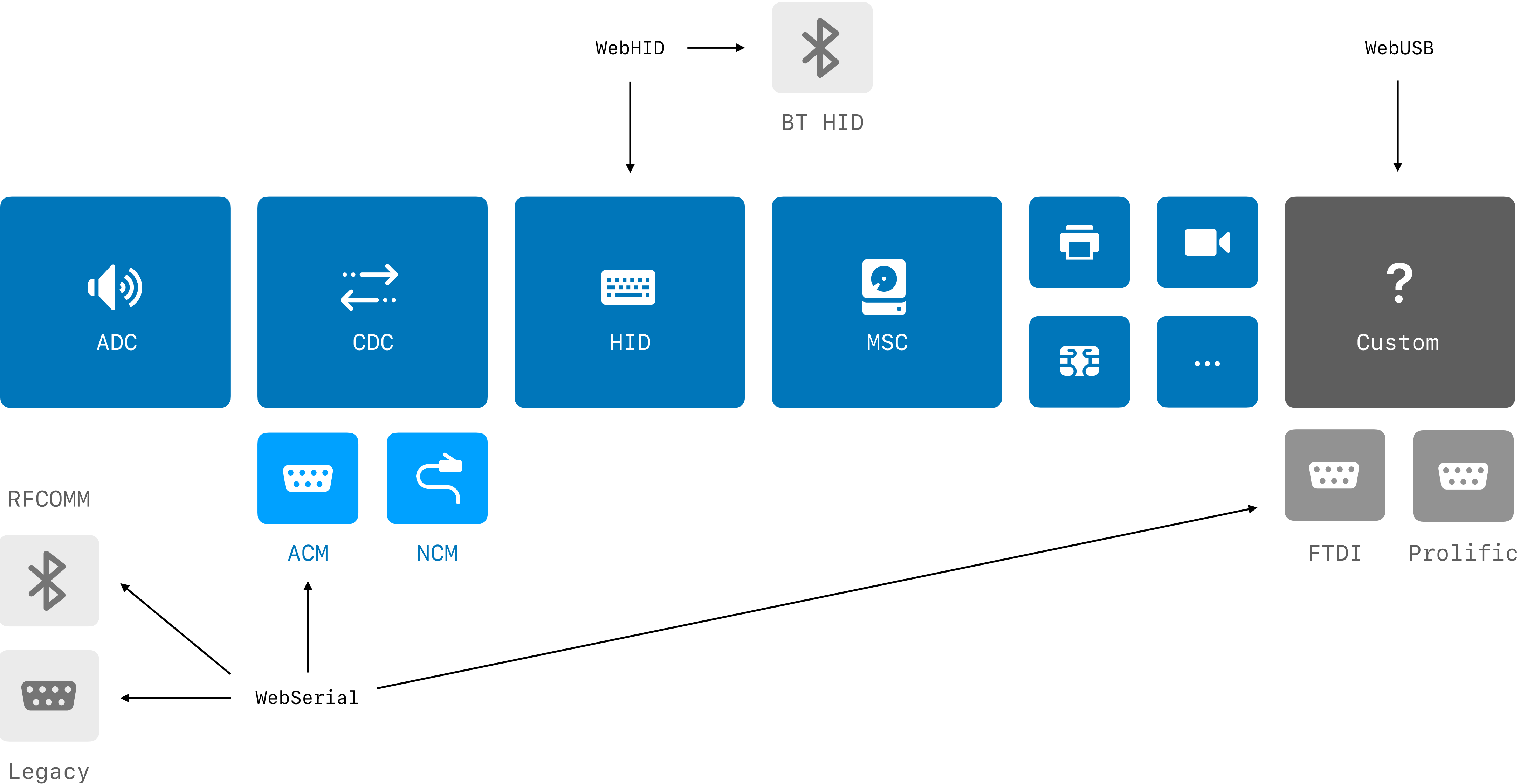
ACM



NCM







WebUSBSerial

<https://github.com/NielsLeenheer/WebUSBSerial>

WebUSBSerial

<https://github.com/NielsLeenheer/WebUSBSerial>

Serial ports are dead. Long live WebSerial.

WebSerialCustomerDisplay

<https://github.com/NielsLeenheer/WebSerialCustomerDisplay>



```
import WebSerialCustomerDisplay from 'webserial-customer-display.esm.js';

const customerDisplay = new WebSerialCustomerDisplay();
await customerDisplay.connect();

customerDisplay.line([
  "Connected with",
  "WebSerial"
]);
```

Barcode scanner



Barcode scanners are just keyboards...

F Spray définition et légèreté, cheveux bouclés: définit les boucles. HydraCoil: Inceil et glycérine aident à préserver les cheveux bouclés. Mode d'emploi: agiter avant emploi. Vaporiser sur les cheveux pré-séchés. Eviter de vaporiser sur une peau mouillée. Projection, rincer immédiatement et abondamment avec de l'eau. coiffeurs. D Pflegespray für optimal geformte Locken: Verleiht den Locken Definition und Leichtigkeit. HydraCoil: Inceil und Glycerin sorgen für langanhaltende Locken. Anwendung: Vor dem Gebrauch schütteln. Auf das gewaschene und abgetrocknete Haar sprühen. Nicht auf gereizte Haut oder die Augen anwenden. Gründlich mit Wasser ausspülen. Verkauf nur über Friseur. M voor haar met krullen: geeft luchtige en veerkrachtige krullen. helpen de vorm en de veerkracht van de krullen langdurig te behouden. vóór gebruik schudden. Op gewassen en handdoekdroog of vochtig haar gebruiken. Niet op een geïrriteerde huid of in de richting van de ogen gebruiken. met de ogen, deze onmiddellijk met overvloedig water wassen. I Trattamento definizione e volume. HydraCoil: Inceil e glicerina aiutano a preservare le ricci. d'uso: INFIAMMABILE, agitare prima dell'uso. Non vaporizzare sui capelli asciutti. Non vaporizzare a contatto con gli occhi, sciacquare immediatamente con acqua. pubblico riservata ai parrucchieri.

1058427 D - INGREDIENTS: AQUA / WATER / ALCOHOL DENAT. • PEG-14 DIMETHICONE / POLYQUATERNIUM-4 • DIMETHICONE / METHYLPARABEN • TRIDECETH-5 • HYDROXYETHYLACRYLATE / BUTYLPHENYL METHYLPROPIONAL • HYDROXYETHYLACRYLATE / BUTYLPHENYL METHYLPROPIONAL • HYDROXYETHYLACRYLATE / BUTYLPHENYL METHYLPROPIONAL • HYDROXYETHYLACRYLATE / BUTYLPHENYL METHYLPROPIONAL

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distr. Italia via Ga
www.lorealprofe



125 ml



100 ml e

3474630 618695



3 4 7 4 6 3 0 6 1 8 6 9 5

..but WebHID allows us to get barcodes
instead of individual keystrokes



```
let devices = await navigator.hid.requestDevice({  
  filters: { vendorId: 0x0c2e }  
});
```

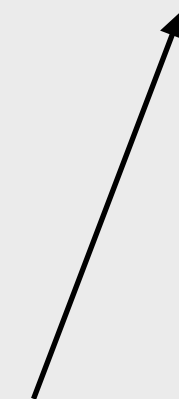
Honeywell Scanning & Mobility



```
let devices = await navigator.hid.requestDevice({  
  filters: { vendorId: 0x0c2e }  
});
```

```
let device = devices.find(d => d.collections.some(c => c.usagePage == 140));
```

Barcode scanner





```
let devices = await navigator.hid.requestDevice({
  filters: { vendorId: 0x0c2e }
});

let device = devices.find(d => d.collections.some(c => c.usagePage == 140));

if (device) {
  await device.sendFeatureReport(254, new Uint8Array([ 0x01 ]));
}
```

Turn off keyboard emulation and use HID reports





```
let devices = await navigator.hid.requestDevice({
  filters: { vendorId: 0x0c2e }
});

let device = devices.find(d => d.collections.some(c => c.usagePage == 140));

if (device) {
  await device.sendFeatureReport(254, new Uint8Array([ 0x01 ]));

  device.addEventListener('inputreport', event => {
    console.log(event.data);
  });
}
```

```
000000  0e 5d 45 30 33 34 37 34 36 33 30 36 31 38 36 39  .]E0347463061869
000010  35 0d 00 00 00 00 00 00 00 00 00 00 00 00 00 00  5.....
000020  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
000030  00 00 00 00 00 00 00 00 00 00 00 00 00 64 00 00  .....d..
```


Length of barcode = 14 characters

Value = 3474630618695

| | | | | | | | | | | | | | | | | | |
|--------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|------------------|
| 000000 | 0e | 5d | 45 | 30 | 33 | 34 | 37 | 34 | 36 | 33 | 30 | 36 | 31 | 38 | 36 | 39 | .]E0347463061869 |
| 000010 | 35 | 0d | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 5..... |
| 000020 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | |
| 000030 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 64 | 00 | 00 | |d.. |

Symbology of barcode = EAN13

Is this the last report for this barcode? 0 = yes

WebHidBarcodeScanner

<https://github.com/NielsLeenheer/WebHidBarcodeScanner>



```
import WebHIDBarcodeScanner from 'webhid-barcode-scanner.esm.js';

const barcodeScanner = new WebHIDBarcodeScanner();
await barcodeScanner.connect();

barcodeScanner.addEventListener('barcode', e => {
  console.log(`Found barcode ${e.value} with symbology ${e.symbology}`);
});
```

WebSerialBarcodeScanner

<https://github.com/NielsLeenheer/WebSerialBarcodeScanner>

Thank you!