

# Raw Panel



— Your parameter values

— Your encoder knobs

— Your joystick

— Your images

— Your button colors

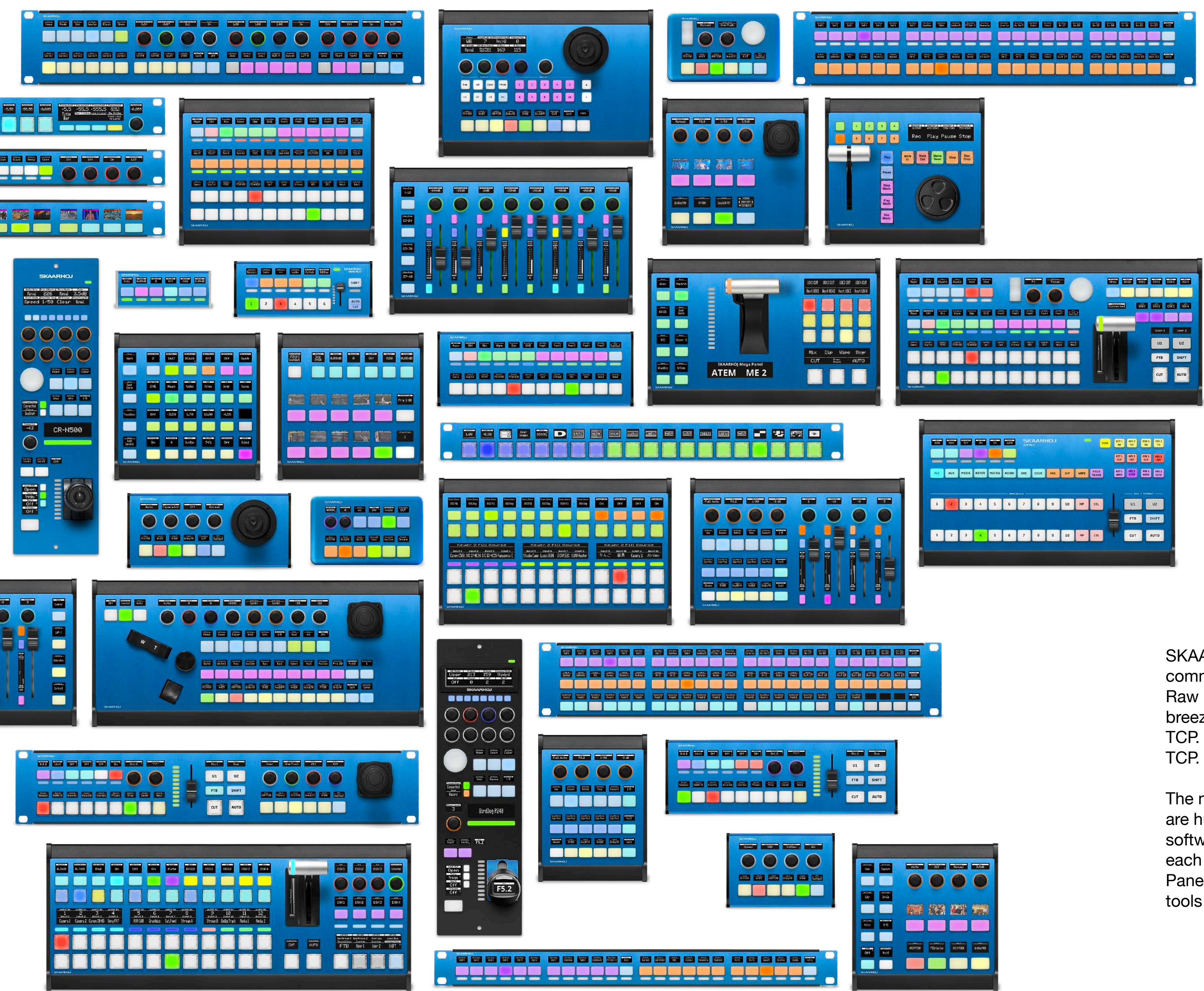
— Your display text

— Your button press

— = Your panel!

Supercharge Your Product with SKAARHOJ Raw Panel





# Raw Panel

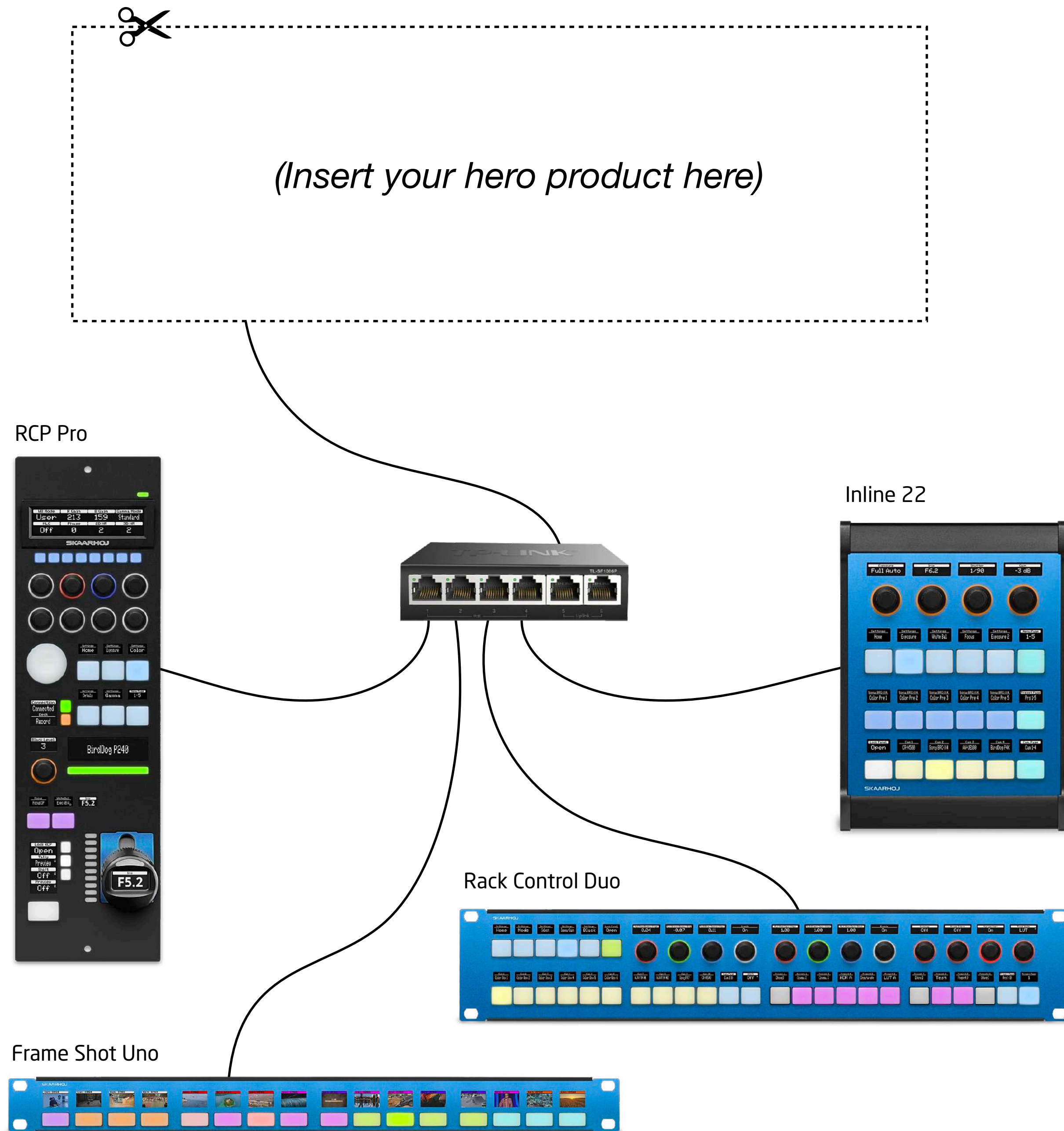
- ★ Supports all SKAARHOJ panels
- ★ Quick and easy start
- ★ IP-networked with TCP server
- ★ Event-based trigger system
- ★ LED and display feedback
- ★ ASCII/binary message encoding
- ★ Graphical Widgets and UTF-8 Text
- ★ Self-describing panel topology
- ★ mDNS/ZeroConf discoverability
- ★ Comprehensive panel emulator
- ★ Valuable toolchain provided

SKAARHOJ panels are the real deal, tailored for broadcast and AV live productions. We're committed to providing a diverse range of tactile control panels for all your broadcasting needs. Raw Panel is our internal backbone protocol, making integration with any SKAARHOJ panel a breeze. Our panels are 100% IP-based with Power over Ethernet (PoE), connecting to clients via TCP. Press a button, turn a knob, move a fader or joystick, and the panel sends triggers back over TCP. Your product can then send color codes and display text or graphics back to the panel.

The messaging protocol is versatile, operating in ASCII or binary mode. In ASCII mode, messages are human-readable and easy to decode, while binary encoding offers greater efficiency for software integration. Raw Panel has a self-describing panel concept, revealing essential details of each hardware component to create configuration interfaces for any Raw Panel-compliant device. Panels are also discoverable with ZeroConf/mDNS, and SKAARHOJ offers a robust set of free tools to emulate any SKAARHOJ panel and explore the Raw Panel protocol.



# Easy!



```
kasper — nc 192.168.11.196 9923 — nc — nc 192.168.11.196...
Last login: Fri Sep  2 22:22:55 on ttys034
[~ > nc 192.168.11.196 9923
list
_model=SK_INLINE22V2
_serial=999923
_name=Inline 22
_platform=simulator
_bluePillReady=1
_serverModeLockToIP=
HWC#2.4=Down
HWC#2.4=Up
HWC#26=Enc:1
```

### Simply Connect

Type "list" and press enter - the panel reveals its identity. Interact with a hardware component (HWC), and you'll get instant feedback.



### T-Bar:

HWC#50=Abs:0  
 HWC#50=Abs:22  
 HWC#50=Abs:39  
 HWC#50=Abs:66  
 HWC#50=Abs:92  
 ...  
 HWC#50=Abs:967  
 HWC#50=Abs:988  
 HWC#50=Abs:1000

# Triggers

# Feedback

### Fader Position:

HWCx#87=21035

Alternative JSON encoding:  
 {"HWCIDs":53,"HWCEntended":  
 {"Interpretation":5,"Value":555}}



### Encoder (Left/Right turns):

HWC#86=Enc:1  
 HWC#86=Enc:2  
 HWC#86=Enc:6  
 HWC#86=Enc:1  
 HWC#86=Enc:-4  
 HWC#86=Enc:-3  
 HWC#86=Enc:-6  
 HWC#86=Enc:-5

### Four-way buttons

HWC#55.8=Down  
 HWC#55.8=Up  
 HWC#55.1=Down  
 HWC#55.1=Up  
 HWC#55.2=Down  
 HWC#55.2=Up  
 HWC#55.4=Down  
 HWC#55.4=Up

(Digits 1,2,4 and 8 are edge detection)

### NKK Broadcast Buttons

HWC#12=Down  
 HWC#12=Up  
 HWC#13=Down  
 HWC#12=Up

(Straight up old school)

### Blue as RGB (3\*2bit):

HWCc#52=203

Alternative JSON encoding:  
 {"HWCIDs":52,"HWCColor":{"ColorRGB":  
 {"Red":52,"Green":213,"Blue":255}}}

### "On" and Amber:

HWC#53=4

HWCc#53=136

Alternative JSON encoding:  
 {"HWCIDs":53,"HWCColor":  
 {"State":4,"HWCColor":{"ColorIndex":{"Index":8}}}

### Text

HWCt#54=|||Output 6|1|Feed1|Drone|1

Alternative JSON encoding:  
 {"HWCIDs":53,"HWCText":  
 {"Formatting":7,"Title":"Output  
 6","Textline1":"Feed1","Textline2":"Drone","PairMo  
 de":1}}





# Message Encoding

## Raw Panel ASCII Command sequence (v1):

```
HWC#53=4
HWCc#53=136
HWCx#53=21035
HWCt#53=|||Output 6|1|Feed1|Drone||1
```

## Raw Panel ASCII JSON (v2):

```
{"HWCIDs": [53], "HWCMODE": {"State": 4}, "HWCCOLOR": {"ColorIndex": {"Index": 8}}, "HWCEXTENDED": {"Interpretation": 5, "Value": 555}, "HWCTEXT": {"Formatting": 7, "Title": "Output 6", "Textline1": "Feed1", "Textline2": "Drone", "PairMode": 1}}
```

## Raw Panel Binary Protobuf command:

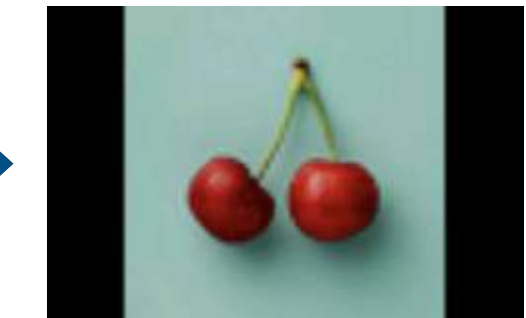
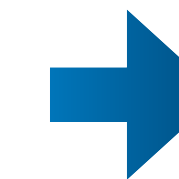
```
34 00 00 00 42 32 0a 01 35 12 02 10 04 1a 04 12 02 08 08 22
05 10 05 18 ab 04 2a 1c 18 07 3a 08 4f 75 74 70 75 74 20 36
4a 05 46 65 65 64 31 52 05 44 72 6f 6e 65 60 01
```

For Raw Panel clients (that's *your* product), Raw Panel can be encoded in ASCII and binary form. SKAARHOJ UniSketch panels support ASCII V1 only, while Blue Pill based panels support ASCII V1, V2 (JSON encoding), and binary Protocol Buffer encoded forms.

Most third-party integrators start with ASCII V1, but may switch to ASCII V2 or binary encoding as needed. Binary encoding, used internally in all SKAARHOJ Blue Pill based products, is the easiest and fastest option for integration with Go (Golang) as we offer numerous free libraries for handling and conversion.

# Widgets and UTF-8

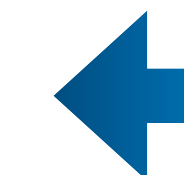
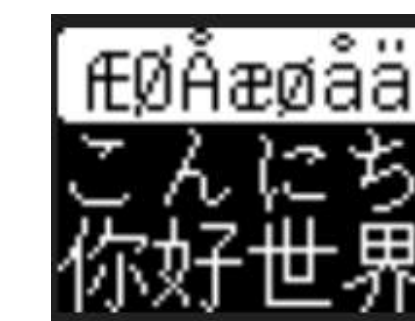
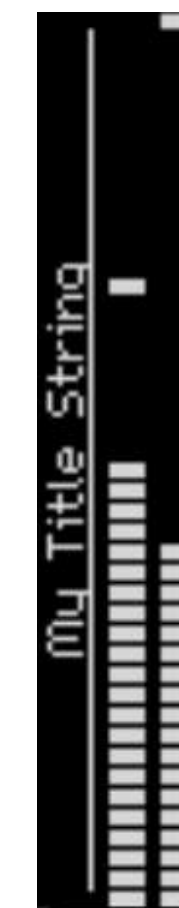
The Raw Panel protocol includes a feature called *Processors*. These are streamlined data structures designed to produce intricate outputs. An example is the *AudioMeter* processor, which converts basic integer values into graphical metering bars on the target display. It adjusts for specific pixel dimensions, ensuring optimal visualization. This feature simplifies the task for Raw Panel integrators, allowing them to achieve impressive and efficient results with minimal effort.



Processors also have capabilities to convert, scale, and adapt standard image formats like PNG, JPEG, and GIF.

Additionally, the *UniText* processor stands out as it can render virtually any UTF-8 symbol. With it, you can transmit any UTF-8 text and have it seamlessly converted for graphical display.

```
{"HWCIDs": [2], "Processors": {"AudioMeter": {"Title": "My Title String", "W": 64, "H": 48, "Data1": 500, "Peak1": 700, "Data2": 400, "Peak2": 1000}}}
```



```
{"HWCIDs": [2], "Processors": {"UniText": {"W": 64, "H": 48, "Title": "ÆØÅæøåä", "SolidHeaderBar": true, "Textline1": "こんにちは", "Textline2": "你好世界"}}}
```



# Self Describing Topology



## JSON and SVG

Panel features are described using a combination of an SVG basis and a JSON data structure for each hardware component. Features include input type, output, extended features, and associated display resolution and color style.

SKAARHOJ utilizes the topology, SVG and JSON to render panel visualizations in our applications and emulators, and so can you!

```
<stop offset="26%" style="stop-color:rgba(166,166,166,0.9);" />
<stop offset="28%" style="stop-color:rgba(194,194,194,0.9);" />
<stop offset="45%" style="stop-color:rgba(186,186,186,0.9);" />
<stop offset="55%" style="stop-color:rgba(117,117,117,0.9);" />
<stop offset="59%" style="stop-color:rgba(155,155,155,0.9);" />
<stop offset="100%" style="stop-color:rgba(14,14,14,0.9);" />
</linearGradient>
<radialGradient id="ElastomerJoystick">
  <stop offset="40%" style="stop-color:rgba(100,100,100,0.2);" />
  <stop offset="59%" style="stop-color:rgba(190,190,190,0.2);" />
</radialGradient>
<rect w="100" h="100" style="fill:url(#frontplateBlack);" />
</svg>
"136": {
  "w": 210,
  "h": 130,
  "out": "rgb",
  "type": "button",
  "label": "Elastomer Four-Way Button"
},
"138": {
  "w": 210,
  "h": 130,
  "out": "rgb",
  "type": "button",
  "label": "Elastomer Four-Way Button"
},
{
  "id": 1,
  "x": 231,
  "y": 1439,
  "txt": "PRV 1",
  "type": 132
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  "id": 2,
  "x": 404,
  "y": 1439,
  "txt": "PRV 2",
  "type": 132
},
{
  "id": 3,
  "x": 578,
  "y": 1439,
  "txt": "PRV 3",
  "type": 132
},
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  "x": 752,
  "y": 1439,
  "txt": "PRV 4",
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### Raw Panel Dummies

SKAARHOJ provides a versatile emulator for Windows, Mac, and Linux, capable of emulating any SKAARHOJ panel. Launch the emulator, and it initiates a TCP server while simultaneously opening a web browser featuring a panel view based on its topology. Engage with the virtual panel – press buttons, rotate encoders, and maneuver faders and joysticks – as the emulator accurately reproduces text, graphics, and LED colors. It even simulates button and display brightness commands along with the sleep timer, ensuring a true-to-life experience!

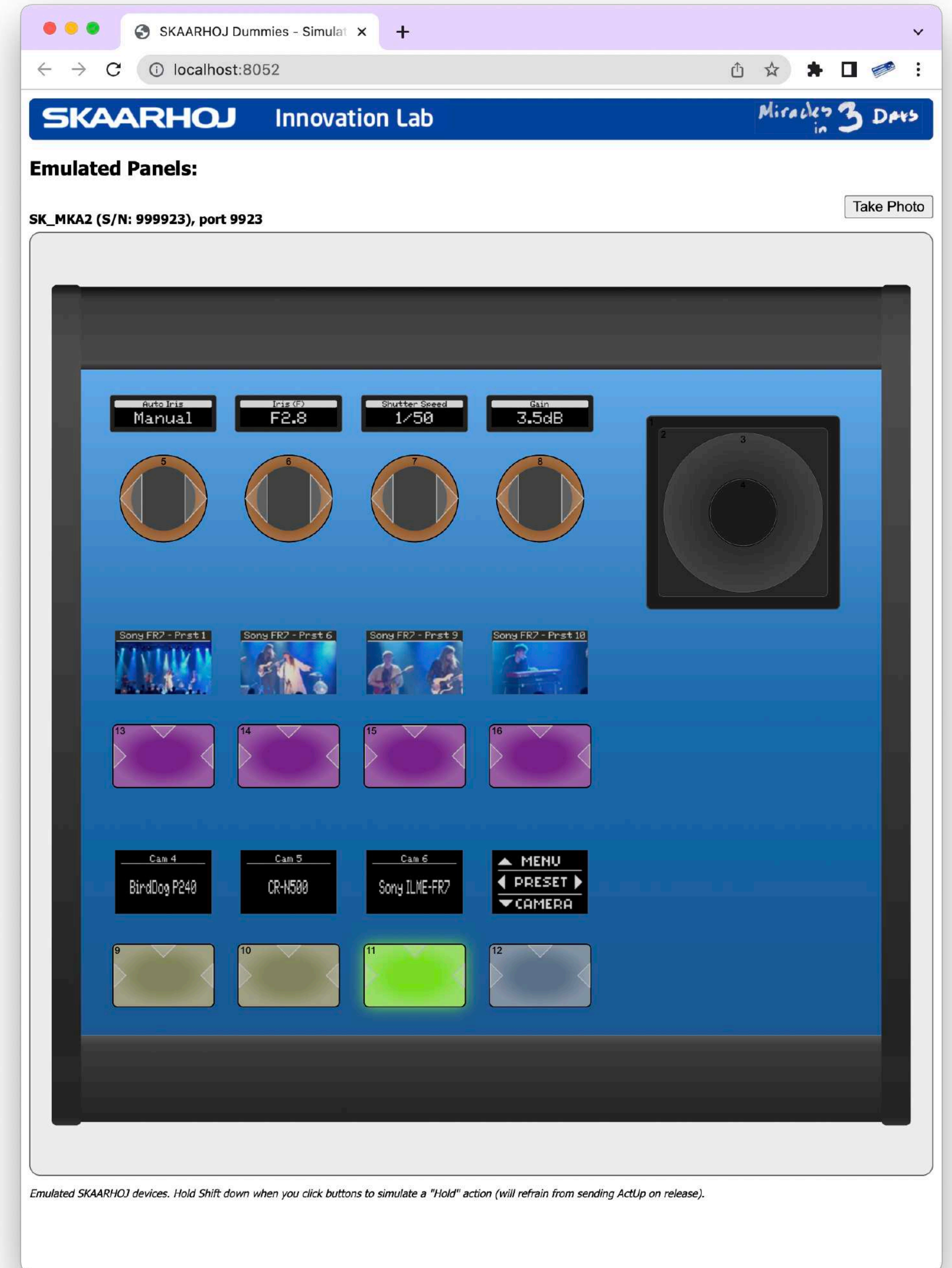


Real World Panel



Raw Panel Dummies

Emulated Panel











Raw Panel API



This Booklet

Air Fly Pro

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