

## DESCRIPTION

Honeywell's MICRO SWITCH CPS Series Cable-Pull Safety Switches provide a readily accessible emergency stop signal, a cost-effective means compared to using multiple emergency stop push-buttons. The CPS Series Cable Pull Safety Switch's internal mechanism latches on both slackened cable (push) and pulled cable.

The 1CPS is intended for use in applications where the cable span is 76 m [250 ft] or shorter. It is an economical solution for shorter runs or zone protection typical to automated systems. The 2CPS Series is intended for use in very long cable runs of 152 m [500 ft] or shorter, such as long conveyor lines found in warehouses.

A line in the midpoint of the cable tension window indicates proper cable tension, providing easy set-up. The direct opening switch contacts are held closed when the actuating cable is under proper tension and the reset knob is set to the RUN position. When the actuating cable is pulled, slackened, or broken, a cam positively opens the NC (Normally Closed) switch contacts. The snap-action operation causes the switch contacts to change state and mechanically latch almost simultaneously when the cable is pulled, slackened, or broken. The NC switch contacts remain open until the CPS is reset by properly tensioning the cable and manually rotating the reset knob.

When the direct opening switch contacts open, the auxiliary contacts also actuate (open contacts close). The auxiliary contacts are electrically isolated from the direct-opening switch contacts. These NO (Normally Open) contacts may be used for monitoring or signaling.

## DIFFERENTIATION

- Internal mechanism latches on both slackened cable (push) and pulled cable


## FEATURES

- Direct opening action of NC (Normally Closed) contacts
- 2CPS: $2 \mathrm{NO} / 2 \mathrm{NC}, 1 \mathrm{NO} / 3 \mathrm{NC}$, or 4NC contact configurations
- 1CPS: $1 \mathrm{NO} / 1 \mathrm{NC}, 2 \mathrm{NO} / 2 \mathrm{NC}, 1 \mathrm{NO} / 3 \mathrm{NC}$, or 4NC contact configurations
- Typical cable span of 76 m [250 ft] in an environment with a temperature change of $\pm 17^{\circ} \mathrm{C}\left[ \pm 30^{\circ} \mathrm{F}\right]$. Longer spans are possible depending upon temperature change and installation
- Choice of three actuator configurations (2CPS)
- Removable contact block version available (2CPS)
- J-hook turnbuckle included (2CPS)
- E-stop option (1CPS)
- Low profile reset and new indicator options (2CPS)
- Large wiring cavity with straight-through wiring
- Models avaliable without broken cable, slack-cable detection
- 24 Vdc or 120 Vac bright, multi-cluster high-intensity LED status indicator light available on 2CPS. Single LED on 1CPS. Low profile LED (2CPS) and emergency stop button (1CPS) options also offered
- Gold-plated contacts are standard on 2CPS, available on 1CPS
- Electrostatic, epoxy-coated, die-cast zinc housing
- Optional hardware packets available


## POTENTIAL INDUSTRIAL APPLICATIONS

- Long conveyor systems found in warehouses and distribution centers
- Conveyor systems with a high amount of vibration
- Conveyor systems that experience wide temperature swings
- Long conveyor systems where easy-through wiring, or highly visible trip status, is required
- Perimeter guarding in hose-down conditions
- Packaging equipment
- Assembly lines


## VALUE TO CUSTOMERS

- Cost-effective means of providing an emergency stop signal compared to multiple emergency stop push buttons
- Capability enhances productivity by minimizing nuisance stops due to variations in temperature, stretch of cable over time, or other application variables
- Direct opening of normally closed contacts when cable is actuated


## PORTFOLIO

The CPS Series is the largest switch in Honeywell's MICRO SWITCH line of safety switches. For more details on the extensive line of Honeywell safety switches, click here.

## MICRO SWITCH Cable-Pull Safety Switches, CPS Series

Table 1. Specifications

| Characteristic | Parameter |
| :---: | :---: |
| Description | cable-pull safety switches |
| Switching options | 1NO/1NC direct acting 2NO/2NC direct acting 1NO/3NC direct acting 4NC direct acting |
| Sealing | IP67, NEMA 1, 4, 12, 13 |
| Contacts | silver, gold plated over silver |
| Conduit/Connectors | 1/2 NPT, PG 13.5, 20 mm , PF 1/2; Brad Harrison 10-pin conductor |
| Force to maintain actuation shaft | 1CPS \& 2CPS: $25 \mathrm{lb}{ }^{\text {* }}$ |
| Actuation shaft operating force | 1CPS \& 2CPS: $40 \mathrm{lb} *$ |
| Operating temperature | $-40^{\circ} \mathrm{C}$ to $80^{\circ} \mathrm{C}$ [-40 ${ }^{\circ} \mathrm{F}$ to $\left.176{ }^{\circ} \mathrm{F}\right]$ |
| Storage temperature | 1CPS: $-40^{\circ} \mathrm{C}$ to $85^{\circ} \mathrm{C}\left[-40^{\circ} \mathrm{F}\right.$ to $\left.185^{\circ} \mathrm{F}\right]$ |
| Mechanical endurance | 1 million operations |
| Rated thermal current ( $\mathrm{I}_{\text {th }}$ ) | 10 A |
| Rated impulse withstand ( $\mathrm{U}_{\text {imp }}$ ) | 2500 V |
| Rated insulation voltage ( $\mathrm{U}_{\mathrm{i}}$ ) | 300 V |
| Useable gold-plated current | 1 mA to $50 \mathrm{~mA}, 60 \mathrm{Vdc}$ max./125 Vdc max. |
| Pollution degree | 3 |
| Conditional short circuit current | 1000 A |
| Short circuit protective device (type/maximum rating) | Class J fuse ( $10 \mathrm{~A} / 600 \mathrm{~V}$ ) |
| Shock | 15 g per IEC 68-2-27 |
| Vibration | 10 Hz to 500 Hz , 5 g per IEC 68-2-6 |
| Approvals | UL, CSA, CE, SIL |
| Standards | - UL Listed per File E37138 against UL508 <br> - CSA Certified per File 57323 against CSA C22.2 No. 14 <br> - CE mark: The CPS complies with Low Voltage Directive 2006/95/EC; Machinery Directive 2006/42/EC only as the directives relate to the components being used in a safety function; EN 60947-1; EN 60947-5-1; EN 60947-5-5 <br> - SIL: MCTF (Mechanical Life): >1,000,000 cycles with single-sided confidence limit of $100 \%$. MCTF (Electrical Life): >25,000 cycles with single-sided confidence limit of $87.5 \%$. Highest SIL Capability: SIL3 (HFT:1), IEC 61508-2: 2010. Proof Test Interval: 1 Year |

* Incline measures, and not typical for manual trip

Table 2. Electrical Ratings

| ac |  | dc |  |
| :---: | :---: | :---: | :---: |
| A300 <br> Ue | AC15 <br> Ie | Q300 <br> Ue | DC13 <br> Ie |
| Volts | Amps | Volts | Amps |
| - | - | 24 | 2.8 |
| 120 | 6 | 125 | 0.55 |
| 240 | 3 | 250 | 0.27 |
| Ith $=10 \mathrm{~A}$ |  |  |  |

## MICRO SWITCH Cable-Pull Safety Switches, CPS Series

Figure 1. 1CPS Product Nomenclature and Order Guide


NOTE: Not all combinations of model code are available.
Please contact your Honeywell provider/representative for assistance.

Figure 2. 2CPS Product Nomenclature and Order Guide


## TEMPERATURE-SPAN DISTANCE APPLICATION INFORMATION

Cable-pull switches featuring broken cable detection require pre-tensioning in order to enable the RUN condition.

The relative expansion or contraction of the steel actuating cable when the ambient temperature increases or decreases must be taken into account when pre-tensioning a cable pull switch.

The change in cable length with change in temperature can cause significant nuisance shut downs on longer runs.
Install the system when the temperature is at the mid point of the extremes. If a warehouse has a low temperature of $15.6^{\circ} \mathrm{C}$ [60 ${ }^{\circ} \mathrm{F}$ ]and a high of $32.2^{\circ} \mathrm{C}$ [ $90^{\circ} \mathrm{F}$ ], set up the system at the midpoint $23.9^{\circ} \mathrm{C}\left[75^{\circ} \mathrm{F}\right.$.
Use an endspring or another CPS at the opposite end of the cable span to double the temperature tolerance and to meet the requirements of EN 418.
Figure 3. Total Temperature Variation vs. Cable Span Distance


A $=$ Total temperature variation
B = Setup point - Ideally at middle of temperature extremes $\mathrm{C}=$ Cable Pull Switch usable temperature span without endspring or second CPS $D=$ Cable Pull Switch usable temperature span with endspring or second CPS $E=$ Cable span distance

Table 3. Circuitry Charts

| Circuitry | Chart |
| :---: | :---: |
| 1NO/1NC | $\oplus$ $\begin{aligned} & 219 \quad 9 \\ & \hline 13+14 \\ & \hline 13+1 \end{aligned}$ |
| 2NO/2NC | $\oplus$ ${ }_{7}^{9}$ $\square$ (1) 219 22 $13-14$ $\xrightarrow[13]{13}$ |
| 1NO/3NC | $\oplus\left(\begin{array}{ll} 21 & 22 \\ \hline & \oplus \\ \hline 13 & 11 \\ \hline \end{array}\right.$ |
| 4NC |  |

Table 4. 1CPS Contact Blocks


## MICRO SWITCH Cable-Pull Safety Switches, CPS Series

Table 5. 2CPS Contact Blocks

| Contact Block Mounted to Housing | Removable Contact Blocks with Heavy-Duty Wiring Receptacles |
| :---: | :---: |
|  |  |
| 2NO/2NC | 2NO/2NC |
| 1NO/3NC | 1NO/3NC |
| 4NC |  |

## MICRO SWITCH Cable-Pull Safety Switches, CPS Series

Table 6. 1CPS With Broken Cable Detection Order Guide


MICRO SWITCH Cable-Pull Safety Switches, CPS Series

Table 7. 1CPS Without Broken Cable Detection Order Guide

| Catalog <br> Listing | Conduit | Switching | Bar Chart $\square$ Contact Closed I $\square$ Contact Open | Contact Material |  |  | Notes |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1CPSA1-N | 1/2 in NPT | 1NO/1NC |  | silver alloy |  |  | - |
| 1CPSA1A-N | 1/2 in NPT | 1NO/1NC |  | silver alloy | $\checkmark$ |  | - |
| 1CPSA1B-N | 1/2 in NPT | 1NO/1NC | cable | silver alloy |  | $\checkmark$ | - |
| 1CPSA2-N | 1/2 in NPT | 2NO/2NC |  | silver alloy |  |  | - |
| 1CPSA2B-N | 1/2 in NPT | 2NO/2NC |  | silver alloy |  | $\checkmark$ | - |
| 1CPSA4B-N | 1/2 in NPT | 4NC |  | silver alloy |  | $\checkmark$ | - |

## MICRO SWITCH Cable-Pull Safety Switches, CPS Series

Table 8. 2CPS With Broken Cable Detection and Silver Alloy Contacts Order Guide

| Catalog Listing |  |  | Bar Chart <br> Contact Closed <br> Contact Open |  |  |  |  | Notes |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2CPSA1A1 | 1/2 in NPT | 2NO/2NC |  | $\checkmark$ |  | Both |  |  |
| 2CPSA1A1A | 1/2 in NPT | 2NO/2NC |  | $\checkmark$ |  | Both | 24 <br> Vdcdc |  |
| 2CPSA1A1A-FW | 1/2 in NPT | 2NO/2NC |  | $\checkmark$ |  | Both | 24 Vdc | 10-pin Brad Harrison connector |
| 2CPSA1A1B | 1/2 in NPT | 2NO/2NC |  | $\checkmark$ |  | Both | $120$ |  |
| 2CPSA1A2 | 1/2 in NPT | 2NO/2NC |  | $\checkmark$ |  | Left only |  |  |
| 2CPSA1A2A | $1 / 2$ in NPT | 2NO/2NC |  | $\checkmark$ |  | Left only | 24 Vdc |  |
| 2CPSA1A2A-FW | 1/2 in NPT | 2NO/2NC |  | $\checkmark$ |  | Left only | 24 Vdc | 10-pin Brad Harrison connector |
| 2CPSA1A2B | 1/2 in NPT | 2NO/2NC |  | $\checkmark$ |  | Left only | $\begin{aligned} & 120 \\ & \mathrm{Vac} \end{aligned}$ |  |
| 2CPSA1A3 | 1/2 in NPT | 2NO/2NC |  | $\checkmark$ |  | Right only |  |  |
| 2CPSA1A3A | 1/2 in NPT | 2NO/2NC |  | $\checkmark$ |  | Right only | 24 Vdc |  |
| 2CPSA1A3A-FW | 1/2 in NPT | 2NO/2NC |  | $\checkmark$ |  | Right only | 24 Vdc | 10-pin Brad Harrison connector |
| 2CPSA1A3B | 1/2 in NPT | 2NO/2NC |  | $\checkmark$ |  | Right only | $\begin{aligned} & 120 \\ & \text { Vac } \end{aligned}$ |  |
| 2CPSA2A1 | 1/2 in NPT | 2NO/2NC |  |  | $\checkmark$ | Both |  |  |
| 2CPSA2A1A | $1 / 2$ in NPT | 2NO/2NC |  |  | $\checkmark$ | Both | 24 Vdc |  |
| 2CPSA2A1B | 1/2 in NPT | 2NO/2NC |  |  | $\checkmark$ | Both | $\begin{array}{\|l} 120 \\ \mathrm{Vac} \end{array}$ |  |
| 2CPSA2A2 | 1/2 in NPT | 2NO/2NC |  |  | $\checkmark$ | Left only |  |  |
| 2CPSA2A2A | 1/2 in NPT | 2NO/2NC |  |  | $\checkmark$ | Left only | 24 Vdc |  |
| 2CPSA2A2B | 1/2 in NPT | 2NO/2NC |  |  | $\checkmark$ | Left only | $\begin{aligned} & 120 \\ & \text { Vac } \end{aligned}$ |  |
| 2CPSA2A3 | 1/2 in NPT | 2NO/2NC |  |  | $\checkmark$ | Right only |  |  |
| 2CPSA2A3A | 1/2 in NPT | 2NO/2NC |  |  | $\checkmark$ | Right only | 24 Vdc |  |
| 2CPSA2A3B | 1/2 in NPT | 2NO/2NC |  |  | $\checkmark$ | Right only | $\begin{aligned} & 120 \\ & \mathrm{Vac} \end{aligned}$ |  |
| 2CPSC1A1 | 20 mm | 2NO/2NC |  | $\checkmark$ |  | Both |  |  |
| 2CPSC1A1A | 20 mm | 2NO/2NC |  | $\checkmark$ |  | Both | 24 Vdc |  |
| 2CPSC1A2 | 20 mm | 2NO/2NC |  | $\checkmark$ |  | Left only |  |  |
| 2CPSC1A2A | 20 mm | 2NO/2NC |  | $\checkmark$ |  | Left only | 24 Vdc |  |
| 2CPSC1A3 | 20 mm | 2NO/2NC |  | $\checkmark$ |  | Right only |  |  |
| 2CPSC1A3A | 20 mm | 2NO/2NC |  | $\checkmark$ |  | Right only | 24 Vdc |  |
| 2CPSC2A1A | 20 mm | 2NO/2NC |  |  | $\checkmark$ | Both | 24 Vdc |  |

Table 8. 2CPS With Broken Cable Detection and Silver Alloy Contacts Order Guide, continued

| Catalog Listing | \# \# 0 0 0 |  | Bar Chart <br> Contact Closed <br> Contact Open |  |  |  |  | Notes |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2CPSA1B1 | 1/2 in NPT | 1NO/3NC |  | $\checkmark$ |  | Both |  |  |
| 2CPSA1B1A | 1/2 in NPT | 1NO/3NC |  | $\checkmark$ |  | Both | 24 Vdc |  |
| 2CPSA1B1A-F01 | 1/2 in NPT | 1NO/3NC |  | $\checkmark$ |  | Both | 24 Vdc | 10-pin Brad Harrison connector |
| 2CPSA1B1B | 1/2 in NPT | 1NO/3NC |  | $\checkmark$ |  | Both | $\begin{aligned} & 120 \\ & \mathrm{Vac} \end{aligned}$ |  |
| 2CPSA1B2 | 1/2 in NPT | 1NO/3NC |  | $\checkmark$ |  | Left only | $\begin{aligned} & 120 \\ & \mathrm{Vac} \end{aligned}$ |  |
| 2CPSA1B2A | 1/2 in NPT | 1NO/3NC |  | $\checkmark$ |  | Left only | 24 Vdc |  |
| 2CPSA1B2A-F01 | 1/2 in NPT | 1NO/3NC | Left 21-22 | $\checkmark$ |  | Left only | 24 Vdc | 10-pin Brad Harrison connector |
| 2CPSA1B2B | 1/2 in NPT | 1NO/3NC | $\begin{array}{r} \text { Switch } 13-14 \\ \hline \text { Right } 11-12 \\ \text { Switch } 21-22 \end{array}$ | $\checkmark$ |  | Left only | $\begin{aligned} & 120 \\ & \text { Vac } \end{aligned}$ |  |
| 2CPSA1B3 | 1/2 in NPT | 1NO/3NC |  | $\checkmark$ |  | Right only |  |  |
| 2CPSA1B3A | 1/2 in NPT | 1NO/3NC |  | $\checkmark$ |  | Right only | 24 Vdc |  |
| 2CPSA1B3A-F01 | 1/2 in NPT | 1NO/3NC |  | $\checkmark$ |  | Right only | 24 Vdc | 10-pin Brad Harrison connector |
| 2CPSA1B3B | 1/2 in NPT | 1NO/3NC |  | $\checkmark$ |  | Right only | $\begin{aligned} & 120 \\ & \mathrm{Vac} \end{aligned}$ |  |
| 2CPSA2B1 | 1/2 in NPT | 1NO/3NC |  |  | $\checkmark$ | Both |  |  |
| 2CPSA2B1A | 1/2 in NPT | 1NO/3NC |  |  | $\checkmark$ | Both | 24 Vdc |  |
| 2CPSA2B1B | 1/2 in NPT | 1NO/3NC |  |  | $\checkmark$ | Both | $\begin{aligned} & 120 \\ & \mathrm{Vac} \end{aligned}$ |  |
| 2CPSC1D1A | 20 mm | 4NC |  | $\checkmark$ |  | Both | 24 Vdc |  |

## MICRO SWITCH Cable-Pull Safety Switches, CPS Series

Table 9. 2CPS Without Broken Cable Detection and With Silver Alloy Contacts Order Guide

| Catalog Listing | \#̀ 0 0 0 0 |  | Bar Chart <br> Contact Closed <br> Contact Open |  |  |  |  | Notes |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2CPSA1A4 | 1/2 in NPT | 2NO/2NC |  | $\checkmark$ |  | Both |  |  |
| 2CPSA1A4B | $1 / 2$ in NPT | 2NO/2NC | $\stackrel{9}{9} 9$ | $\checkmark$ |  | Both | 120 Vac |  |
| 2CPSA1A5B | 1/2 in NPT | 2NO/2NC |  | $\checkmark$ |  | Left only | 120 Vac |  |
| 2CPSA1A6B | 1/2 in NPT | 2NO/2NC | Left 21-22 | $\checkmark$ |  | Right only | 120 Vac |  |
| 2CPSA2A4A | 1/2 in NPT | 2NO/2NC | Right 21-22 |  | $\checkmark$ | Both | 24 Vdc |  |
| 2CPSA2A4B | $1 / 2$ in NPT | 2NO/2NC | Switch 13-14 |  | $\checkmark$ | Both | 120 Vac |  |
| 2CPSC1A4-F02 | 20 mm | 2NO/2NC | cab | $\checkmark$ |  | Both |  | No turnbuckles included |

## MICRO SWITCH Cable-Pull Safety Switches, CPS Series

Figure 4. 1CPS Dimensional Drawing


## MICRO SWITCH Cable-Pull Safety Switches, CPS Series

Figure 5. 2CPS Dimensional Drawing


## MICRO SWITCH Cable-Pull Safety Switches, CPS Series

Figure 6. 1CPS Application Information


Figure 7. 2CPS Application Information


## MICRO SWITCH Cable-Pull Safety Switches, CPS Series

Table 10. Accessories/Hardware Packets

| Catalog Listing | Accessory |
| :---: | :---: |
| CLSZC1 | Cable - 7,6m [25 ft] length |
| CLSZC2 | Cable - 15,2 m [50 ft] length |
| CLSZC3 | Cable - 30,5 m [100 ft] length |
| CLSZC4 | Cable - 45,7 m [150 ft] length |
| CLSZC5 | Cable - 61 m [200 ft] length |
| CLSZC7 | Cable - 76,2 m [250 ft] length |
| CLSZTC | (2) Thimbles <br> (2) Low-profile duplex cable clamps |
| CLSZ1S | (1) Draw-bar endspring |
| CPSZ1E | M6 $\times 1 \times 60 \mathrm{~mm}$ eyebolt |
| CPSZ1S | (1) Draw-bar endspring |
| CPSZK1 | (1) J-hook turnbuckle with lock nuts <br> (2) Thimbles <br> (2) Low-profile duplex cable clamps <br> (16) Sets of cable supports [(16) 1/4-20 eye bolts, (32) 1/4-20 nuts, (32) flat washers, (16) lock washers] |
| CPSZK2 | European hardware packet <br> (1) J-hook turnbuckle with lock nuts <br> (2) Thimbles <br> (2) Stainless steel cable clamps <br> (16) Sets of cable supports [(16) 1/4-20 eye bolts, (32) 1/4-20 nuts, (32) flat washers, (16) lock washers] |
| CPSZTB | J-hook turnbuckle with lock nuts (included with 2CPS) |
| CPSLED24 | Multi-cluster LED accessory - 24 Vdc (conduit mount) |
| CPSLED120 | Multi-cluster LED accessory - 120 Vac (conduit mount) |
| CPS-BRACKET | Mounting bracket (to be used with 1CPS or 2CPS) |

Figure 8. CPSLED Dimensional Drawing


A Multi-LED red pilot light
B 1/2-14 NPSM Thread
C 18 AWG red PVC insulation
D 18 AWG black PVC insulation

Figure 9. CPS-Bracket


## ADDITIONAL MATERIALS

The following associated literature is available on the Honeywell web site at sensing.honeywell.com:

- Product line guide
- Product part listing/nomenclature tree
- Product range guide
- CPS troubleshooting guide
- Electromechanical safety switch product selection guide
- Application note: MICRO SWITCH switches in conveyor applications


## For more information

Honeywell Sensing and Internet of Things services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing or the nearest Authorized Distributor, visit sensing.honeywell.com or call:

| Asia Pacific | +65 6355-2828 |
| :--- | :--- |
| Europe | $+44(0) 1698481481$ |
| USA/Canada | $+1-800-537-6945$ |

## $\triangle$ WARNING RISK TO LIFE OR PROPERTY

Never use this product for an application involving serious risk to life or property without ensuring that the system as a whole has been designed to address the risks, and that this product is properly rated and installed for the intended use within the overall system.
Failure to comply with these instructions could result in death or serious injury.

## $\triangle$ WARNING MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.
Failure to comply with these instructions could result in death or serious injury.


## Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, in its sole discretion, finds defective. The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.

While Honeywell may provide application assistance personally, through our literature and the Honeywell web site, it is buyer's sole responsibility to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this writing.
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## Honeywell Sensing and Internet of Things

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