

## Product Description

The 420 Power Component is a customizable sequencer designed to be used in the AmP™ platform. Combine the C420 component with other Power Components to create a custom-defined, AnDAPT AmP on-demand power management device.

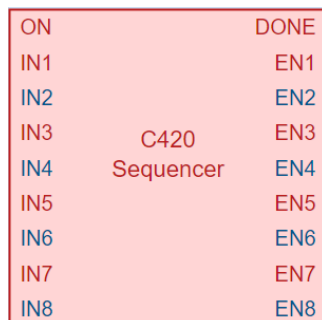
## Features

- Adjustable, programmable sequencer
- Up to eight independent input and output controls
- Connect inputs and outputs to status outputs and control inputs on other regulators or switches
- Cascadible with selectable dependencies
- Adjustable delays:
  - up to 160,000 ms

## Block Diagram

Figure 1 provides a block diagram for the **Error! Reference source not found.** Power Component when integrated with other power rails in an AmP application. Signal names alternate in color on Group boundaries.

Figure 1: C420 application schematics



## Description

The C420 component provides a customizable number of sequencer inputs and outputs with customizable dependencies and customizable delays between each sequence step, ranging from 0.2 ms to 160,000 ms. The inputs and outputs connect to various control inputs and status outputs of the regulators and switches in the application. These customizable values are specified by the power engineer using AnDAPT's cloud-based WebAmp™ development software.

## Customizable Options

Table 1 lists the various customizable options available for the **Error! Reference source not found.** Power Component. These options are set graphically in the WebAmp development software.

Table 1: **Error! Reference source not found.** Customizable Options

Option
Enable input (ON)
Number of trigger inputs
Number of outputs
Groups
Channels
Sequencer dependency
Delay on each output
Sequence complete output (DONE)

## System Characteristics

Table 2: **Error! Reference source not found.** System Characteristics

Parameters	Min	Max	Units
<b>Control</b>			
Delay from input to output, each output	0.20	160,000	ms

## Fault Conditions

A PGood condition that de-asserts before all sequences are complete (DONE signal high), results in a shut-down sequence. It is the responsibility of the controller driving the ON signal to monitor for time out in the event DONE never goes high. In that case ON must be toggled low to restart the sequence. PGood signals going low after done initiates a normal shut-down sequence ending with DONE going low.

Sequencer behavior may be affected when Telemetry Interfaces I480 or P480 disable the EN inputs to I or P series Power Components.

For other device specifications, see the AnDAPT AmP Platform datasheet.

## Sequencer Parameter entry

The C420 allows up to eight channels allocated over up to eight groups selected with delays of 0.2 to 160,000 ms each.

Figure 2: C420 Sequencer Parameter entry: Eight Groups, Eight Channels

### Sequencer

#### POL Specification

Number of POLs

Number of Seq. Groups

#### Time Specification

Time Step  ms

Number of Steps

Maximum Delay  ms

#### Delays

	Channels	Target Delay ms	Actual Delay ms
Group 1	<input type="text" value="1"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
Group 2	<input type="text" value="1"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
Group 3	<input type="text" value="1"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
Group 4	<input type="text" value="1"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
Group 5	<input type="text" value="1"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
Group 6	<input type="text" value="1"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
Group 7	<input type="text" value="1"/>	<input type="text" value="4"/>	<input type="text" value="4"/>
Group 8	<input type="text" value="1"/>	<input type="text" value="4"/>	<input type="text" value="4"/>

## C420 Resource Usage for 8 channels

Circuit Stats...	
Number of AnD_ATC_IO	18
Number of AnD_PMT	1
Number of AnD_PTG_Phase_Count	1
Number of AnD_PTG_GBUF	1
Number of AnD_PTG_OSC	1
Number of AnD_DFF	17
Number of LUT4	64
Resource Usage...	
io	18 used (Capacity 24)
clb	8 used (Capacity 64)
pmt	1 used (Capacity 16)
ptg	1 used (Capacity 2)
uLogic	64 used (Capacity 512)
Components Stats...	
\$techmap\component_1	
AnD_DFF	17
component_1	
AnD_PMT	1

## Application Example, Two Groups, two Channels

The **Error! Reference source not found.** Sequencer application example, Figure 5, sequences a C750 Load Switch with a C710 LDO. When ON pin 24 is asserted high, C420 Sequencer asserts EN1 high after Group 1, Delay1, 0.25 ms as shown in Figure 4 and specified in Parameters entry, Figure 3. When C750 Load Switch determines that power is good, it asserts PGood1 connected to Sequencer IN1. After specified Group 2 Delay2, 0.25 ms the C420 Sequencer asserts EN2, enabling C710 LDO. When C710, LDO determines that power is good, it asserts PGood2 connected to Sequencer IN2. Then C420 Sequencer asserts DONE high, completing the turn on sequence. When ON pin 24 is asserted low, C420 Sequencer, in reverse order, sequences down until DONE is asserted low, completing the turn off sequence.

Figure 3: C420 Sequencer Parameter entry: Two Groups, two Channels

Sequencer		
	Channels	Delays (ms)
Group 1	1	0.25
Group 2	1	0.25

Figure 4: C420 Sequencer example waveform Two Groups, two Channels

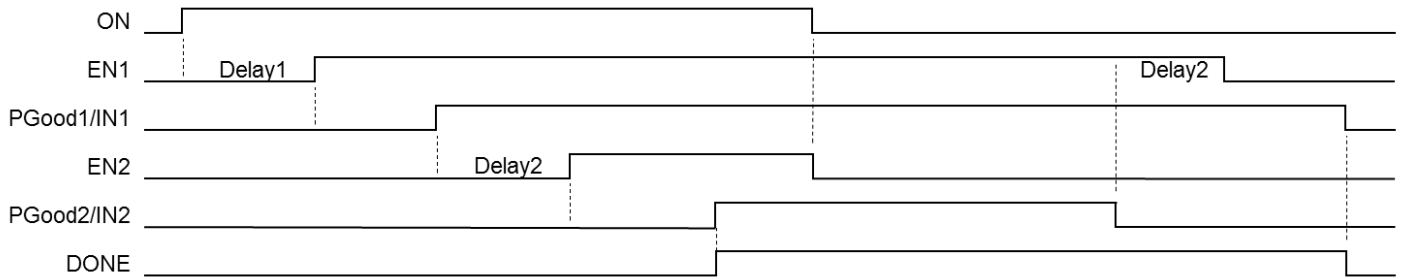


Figure 5: C420 Sequencer example schematic Two Groups, two Channels

