MAXSYS™

PC4010CF/4020CF v3.0 • Standby Battery Calculation Charts

Standby Battery Calculation Chart: Fire Applications

The PC4010CF/4020CF control panel provides regulated current for the panel, Auxiliary, switched Auxiliary, PGM outputs, Addressable loop devices and Combus connected modules. The bell circuit on the main panel is not used for fire alarm notification appliances which means that alarm current is not a part of the main panel battery calculation. Fire Alarm Notification appliances are powered by one or more PC4702BP panels connected to the Combus. Each of the PC4702BP panels has its own standby battery. [See Figure 1: Typical System Layout.]

All components that draw power from the main panel must be considered in the standby battery calculation. This includes any 2-wire smoke detectors connected to the PC4701 2-wire smoke zone. Consult the smoke detector manufacturer's installation documents for current draw.

To calculate the minimum size of standby battery required for your system:

1. If you are using addressable devices, calculate the current load on each of the addressable loops using charts 2 and 3 (only chart 2 is required for the PC4010CF). Tranfer the totals to chart 1.
2. Calculate the Combus load using chart 4. Transfer the total to chart 1.
3. Complete the rest of chart 1.
4. Total the current draw in chart 1 and write the total in box 1 of the calculation below the chart.
5. Complete the calculation steps below chart 1. The answer in box 5 is the minimum standby battery size.
6. If the standby battery size calculated exceeds 14 Ah (2 - 7Ah batteries fit in the cabinet) then either
   - reduce the current loading on the main panel, or
   - install the PS4350 external battery charger, which can take batteries up to 60Ah in size.

   The easiest way to reduce current loading is to use a PC4204CF configured for Combus repower to power all the system components that are connected to the Combus (see Figure 1). See chart 5 for PC4204CF standby battery calculation.

Chart # 1 - Panel overall calculation

Outputs or components drawing current from the panel	Current (mA)	Notes
PC4010 panel (97mA) **OR** PC4020 (130mA) panel		fixed
PC4701 fire module mounted in the main cabinet (1 only)	35	fixed
T-Link Communicator	150mA	
Skyroute Max	30mA	
Smoke detectors connected to the PC4701 fire module		--
PGM 1 output {50 mA max.}		see Note 2
PGM 2 output {50 mA max.} *(PC4020CF panels only!)*		see Note 2
Addressable loop # 1 {170 mA max.}		from Chart 2
Addressable loop # 2 {170 mA max.} *(PC4020CF panels only!)*		from Chart 3
AUX output on the main panel {500 mA max.}		see Note 3
SAUX output on the main panel {300 mA max.}		see Note 3
Combus load {500 mA max.}		from Chart 4

NOTE 1:
***For 60 hours standby time**, the largest battery is 65Ah and the maximum current cannot exceed 900mA.*
***For 24 hours standby time,** the largest battery is 31Ah and the maximum current cannot exceed 1065mA.*

Under no circumstances can the maximum current in line 1 exceed 1065mA.

Total current from the main control panel {See Note 1} ..... 1 [ ] **mA**

X

Standby time {24 or 60 hours} ..... 2 [ ] **Hours**

Multiply total standby current in mA (1) by the standby time in hours (2). Write total in box 3 ..... (1 x 2) = 3 [ ]

X

Derating factor & conversion to Amp-Hours ..... 4 [0.0012]

Multiply (3) by the derating factor (4) ..... (3 x 4) = 5 [ ] **Amp-Hour**

This is the minimum size battery required to maintain the main panel for the standby time selected

NOTE: *Alarm notification power is not supplied by the PC4010CF/4020CF panel, and is therefore not part of this calculation. See the PC4702BP description on the last page.*

Chart # 2 - Addressable Loop # 1 Loading

Item	Current (mA)	x	Quantity	Total (mA)
AMS-220/T	0.8	x		
AMB-300	2.5	x		
AMB-500	2.5	x		
AMB-600	3.5	x		
AMA-100	3.5	x		
AMP-700	0.8	x		
AMP-701	0.8	x		
AMX-400	40	x		

Total for chart 2 (current addressable loop # 1) ..... [ ]
Transfer to Chart 1

Chart # 3 - Addressable Loop # 2 Loading (PC4020CF only!)

Item	Current (mA)	x	Quantity	Total (mA)
AMS-220/T	0.8	x		
AMB-300	2.5	x		
AMB-500	2.5	x		
AMB-600	3.5	x		
AMA-100	3.5	x		
AMP-700	0.8	x		
AMP-701	0.8	x		
AMX-400	40	x		

Total for chart 3 (current addressable loop # 2) ..... [ ]
Transfer to Chart 1.

Chart # 4 - Combus Loading

Item	Current (mA)	x	Quantity	Total (mA)
LCD4500 series	50	x		
LCD4501 series	90	x		
PC4108A	30	x		
AUX output current of PC4108A ---------->				
PC4116	30	x		
AUX output current of PC4116 ---------->				
PC4164RS	110	x		
PC4702BP	75	x		
PC4204(CF)	30	x		
PC4204CX(CF)	30	x		
PC4216 *	15	x		
*Current for connected devices ---------->				
PC4820	35	x		
PC4400	30	x		

Total for chart 4 (current on the Combus) ..... [ ]
Transfer to Chart 1.

NOTE 2: *PGM1 and PGM2 can be used as standard PGM outputs or as addressable loops. Each output configured as a PGM output can supply up to 50mA maximum. Each output configured as an addressable loop can supply up to 170mA maximum*

NOTE 3: *The total current available for the AUX output and the SAUX output is 500mA. All of the 500mA can be drawn from the AUX. output and in this case none can be taken from the SAUX output.*
The maximum current that can be drawn from the SAUX output is 300mA and in this case only 200mA would remain for the AUX output.

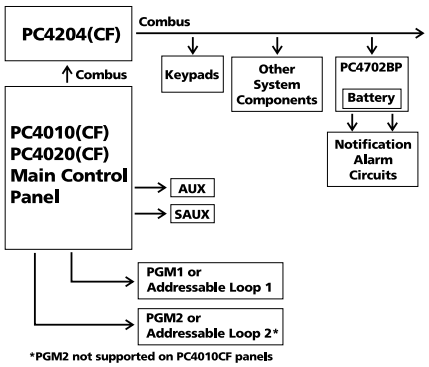
IMPORTANT

Only add up the current for those components that are between the control panel and the first PC4204CF module.

*All components on the Combus that are connected **after** the first PC4204CF should be powered from the PC4204CF and should not draw current from the main control panel.*

See Chart 5 for PC4204CF standby battery calculation.

Figure 1: Typical System Layout



Calculation Chart for PC4204CF – Quad Relay and Combus Repower Module

Each PC4204CF in the system must be evaluated for standby loading. If the first PC4204CF is loaded beyond its capacity or the batteries within its cabinet cannot support the required standby time then another PC4204CF panel must be added. The standby time for each PC4204CF in the system is calculated independently. Each PC4204CF panel can accommodate up 14 Ah worth of batteries (2 - 7Ah batteries).

NOTE: *If more than one PC4204CF is used in the system, copy this page and repeat the calculation for each PC4204CF panel used.*

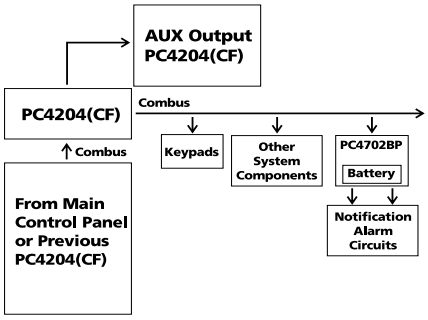
To calculate the minimum size of standby battery required for the PC4204CF:

1. Complete chart 5.
2. Total the current draw in chart 5 and write it in box 1 of the calculation below the chart.
3. Complete the calculation steps below chart 5. The answer in box 5 is the PC4204CF minimum standby battery size.

Chart #5 - Standby calculation for PC4204CF

Item	Current (mA)	x	Quantity	Total (mA)
LCD4500 series	50	x		
LCD4501 series	90	x		
PC4108A	30	x		
AUX output current of PC4108A ---------->				
PC4116	30	x		
AUX output current of PC4116 ---------->				
PC4164RS	110	x		
PC4702BP	75	x		
PC4204(CF)	30	x		
PC4216 *	15	x		
*Current for connected devices ---------->				
PC4820	35	x		
PC4400	30	x		
Current drawn from the Aux output				

Figure 2: Typical PC4204CF Layout



NOTE 5: *If the PC4204CF is not set up for Combus repower, include the current drawn by the downstream components in the standby battery calculation for either the previous PC4204CF or the main panel.*

If the PC4204CF is set up for Combus repower, include the current drawn by the downstream components in the standby calculation for this module.

Any current drawn from the AUX output must be included in the standby calculation for this PC4204CF module.

Total current supplied by PC4204CF {see Note 4}...1 ____ **mA**

Standby time {24 or 60 hours}.....2 ____ **Hours**

Multiply total current in mA (1) by the standby time in hours (2).....(1 x 2) = 3 ____

Derating factor & conversion to Amp-Hours.....4 0.0012

Multiply (3) by the derating factor (4).....(3 x 4) = 5 ____ **Amp-Hour**

NOTE 4: *With a 14Ah battery and* ***24 hours*** *standby time, the maximum current supplied is 485mA.*
60 hours *standby time, the maximum current supplied is 190mA.*

This is the minimum size battery required to maintain the PC4204CF for the standby time selected.

PC4702BP: Alarm Notification - Standby

Each PC4702BP panel in the system requires 2 - 4Ah batteries in series to provide standby power. This capacity is sufficient for at least 60 hours of standby, because when AC is lost the Combus provides supervisory power for the dual bell module. Nothing is drawn from the batteries in standby mode.

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