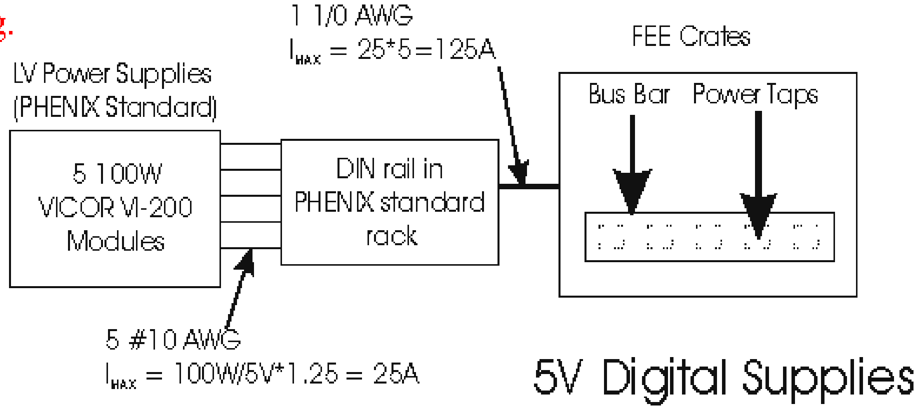
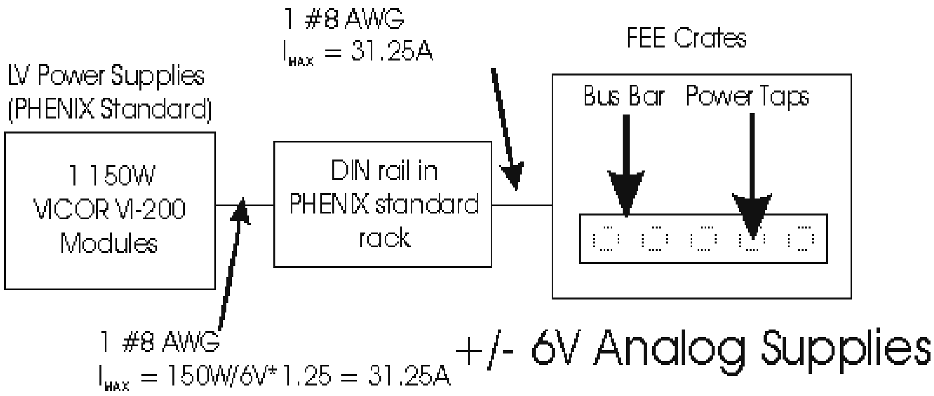
LVPS-to-FEE Crates

- Three voltages:
  - +/- 6V Analog.
  - +5V Digital.





TECHNICAL DATA

CURRENT CARRYING CAPACITY OF COPPER CONDUCTORS

Current carrying capacity is defined as the amperage a conductor can carry before melting either the conductor or the insulation. Heat, caused by an electrical current flowing through the conductor, will determine the amount of current a wire will handle. Theoretically, the amount of current that can be passed through a single bare copper wire can be increased until the heat generated reaches the melting temperature of the copper.

There are many factors which will limit the amount of current that can be passed through a wire. These major determining factors are:

Conductor Size:
The larger the circular mil area, the greater the current capacity.
The amount of heat generated should never exceed the maximum temperature rating of the insulation.

Ambient Temperature:
The higher the ambient temperature, the less heat required to reach the maximum temperature rating of the insulation.

Conductor Number:
Heat dissipation is lessened as the number of individually insulated conductors, bundled together, is increased.

Installation Conductors:
Restricting the heat dissipation by installing the conductors in conduit, duct, trays or raceways lessens the current carrying capacity. This restriction can be alleviated somewhat by using proper ventilation methods, forced air cooling, etc.

Taking into account all the variables involved, no simple chart of current ratings can be developed and used as the final word when designing a system where amperage ratings can become critical.

The chart shows the current required to raise the temperatures of single insulated conductor in free air (30°C ambient) to the limits of various insulation types. The following table gives a derating factor to be used when the conductors are bundled. These charts should only be used as a guide when attempting to establish current ratings on conductor and cable.

DERATING FACTORS FOR BUNDLED CONDUCTORS

BUNDLE #	DERATING FACTOR (X AMPS)
2-5	0.8
6-15	0.7
16-30	0.5

CURRENT CARRYING CAPACITY OF COPPER CONDUCTORS (Measured in Amperes)

	INSULATION MATERIALS AT GIVEN TEMPERATURES				
CONDUCTOR SIZE	POLYETHYLENE NEOPRENE POLYURETHANE POLYVINYLCHLORIDE (SEMI-RIGID) AT 80°C	POLYPROPYLENE POLYETHYLENE (HIGH DENSITY) AT 90°C	POLYVINYLCHLORIDE PVC (IRRADIATED) NYLON AT 105°C	KYNAR POLYETHYLENE (CROSSLINKED) THERMOPLASTIC ELASTOMERS AT 125°C	KAPTON TEFLON SILICONE AT 200°C
30 AWG	2	3	3	3	4
28 AWG	3	4	4	5	6
26 AWG	4	5	5	6	7
24 AWG	6	7	7	8	10
22 AWG	8	9	10	11	13
20 AWG	10	12	13	14	17
18 AWG	15	17	18	20	24
16 AWG	19	22	24	26	32
14 AWG	27	30	33	40	45
12 AWG	36	40	45	50	55
10 AWG	47	55	58	70	75
8 AWG	65	70	75	90	100
6 AWG	95	100	105	125	135
4 AWG	125	135	145	170	180
2 AWG	170	180	200	225	240

Single Conductor in Free Air 30°C Ambient Temp.

Figure 5.1: Table of current-carrying capacity of Cu wire.