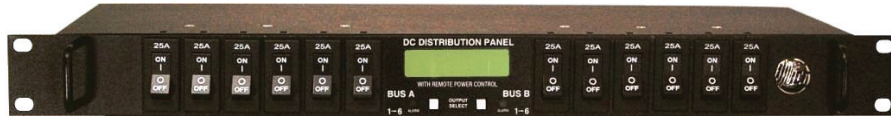


HOW TO SELECT THE RIGHT MANAGED DC LOAD DISTRIBUTION PANEL



OVERVIEW

DC load distribution panels are an integral part of safe, efficient communications site designs. Multiple loads can be connected to allow a DC power supply to distribute power to up to 12 devices such as radios, repeaters, switches and links. When ICT pioneered the use of TCP/IP Ethernet to add remote monitoring of each connected load, as well as the ability to power cycle each output remotely, it opened up a new range of benefits to tower site designers and managers by reducing the need to visit the site to trouble shoot, or power cycle a locked up device.

HOW TO CHOOSE THE RIGHT MANAGED DC LOAD DISTRIBUTION PANEL

There are a number of considerations before choosing the right load panel for your application. Total system current and individual load current needs; single bus or dual bus design; positive or negative ground (or both); and what type of over current protection is required to protect not only the site, but worker safety as well.

POLARITY

Most 12 and 24VDC systems operate with a negative ground. If the entire system is the same polarity, then a single bus load panel may be the best choice. Some sites however will operate with only a positive ground, therefore it's important to check to see if the load panel you are considering supports the type of ground you need. More frequently sites are starting to mix DC voltages and polarities, such as when negative ground 12 volt DC repeaters are used along with positive ground (-48VDC) backhaul radios at the same site. In this case it is not only essential, but far more cost effective, to utilize a dual bus load panel that can support two different voltages and polarities, simultaneously, such as the **ICT Distribution Series 3** family.

SIZING

When designing a system, careful consideration must be given to not only the total system current you require the load panel to handle, but also the individual output load requirements. Some panels may offer relatively high individual output load ratings, say 25 amps, but if the total system current rating is only 100 amps then only four outputs would be usable.

On the **ICT Distribution Series 2** family of load panels, for example, three outputs are provided that are rated at 40A amps each, and 9 outputs rated at 25 amps each. The 40 amp outputs are useful for higher loads, such as RF amplifiers, while the 180 amp peak system current rating ensures sufficient current is available for other more standard connected devices.

For very high power requirements, the **ICT Distribution Series 3** provides up to 240 amps of system current capacity with eight outputs rated at 25 amps each, a solution well suited to higher current applications like LTE radios.

SAFETY

The main function of a fuse or circuit breaker is to protect conductors and equipment from damaging overcurrents and quickly deenergize faulted circuits minimizing hazards to personnel. The absence of such a device could result in dangerous conditions, either as a result of heat buildup during an overload condition, or to employees who are not able to visually confirm a circuit has been de-energized before working on it.

Standard Electrical Safety guidelines from organizations like NFPA, IEEE, ANSI, NEMA and many building codes provide clear direction regarding safety of electrical device installation and maintenance, including:

Utilize fuses (or breakers) with blown fuse (or breaker) indication to minimize exposure to energized components while trouble-shooting the circuit. Provide selective coordination (only the area where the fault occurs is shut-off). Provide a system that is safe to service and maintain.

OSHA 29 CFR 1910.334(b)(2) states " *Reclosing circuits after protective device operation - after a circuit is deenergized by a circuit protective device, the circuit may NOT be manually reenergized until it has been determined that the equipment and circuit can be safely reenergized.*"

Almost all DC load distribution panels in the market, including the ICT Distribution Series product line, utilize fuses or breakers in accordance with safety guidelines issued by these organizations.

ICT Distribution Series 3 panels, for example, allow the user to set individual current settings for each output that can act as an electronic, remotely resettable fuse, while still providing the safety and peace of mind from having an over-current fuse or circuit breaker to protect the device, the premises, and employees. When a fuse or circuit breaker trips, it is highly advisable to visit the site to determine what the source of the over-current event was, something that is not possible to do remotely.

LOAD PANEL SELECTION CONSIDERATIONS

When selecting a managed DC load distribution panel, the following guide provides some key factors to consider before making a purchase decision.

Factor	Importance	ICT Offers	Other Brands
Bus Design	Single bus is ideal for applications that require all the devices use the same voltage and polarity. Dual bus allows for different voltages and polarities on the same panel.	Single and Dual Bus models.	May offer only one model of single or dual bus design, with limitations on which polarity can be used.
Polarity	Sites can be designed to operate with a negative or positive ground, or sometimes both, depending on the type of equipment being installed.	Single bus models for positive or negative grounds, and dual bus models that support positive or negative polarities on the same panel. Suitable for POS or NEG 48, 24 or 12VDC systems.	May offer negative ground only, not suitable for -48VDC systems.
Current Rating	Both the individual output rating and total system rating must be considered when selecting a load distribution panel.	Single bus models feature individual output ratings up to 40A, with 180A peak system current rating. Dual bus models feature individual output ratings up to 25A each, and up to 240A peak system current rating.	May provide output ratings up to 25A each, but a total system rating of only 100A.
Safety	Power systems design conventions include the use of mechanical safety devices such as fuses or circuit breakers to prevent a device failure from turning into a more serious problem such as over-heating or burning of wire insulation. They also provide a level of safety for employees by ensuring circuits are de-energized before conducting any work on the circuits, in compliance with OSHA and NFPA guidelines.	All ICT Distribution Series DC load panels utilize fuses or circuit breakers as a safety compliant measure to ensure no hazardous conditions can occur as a result of over current conditions caused by a faulty device connected to the panel.	Some brands may not use any mechanical safety devices, possibly creating a site or employee safety hazard.
Additional Functionality	When considering choice of panel, determine what additional features and benefits are provided.	All ICT Intelligent load panels with remote power control provide 5 digital inputs that can be used to connect site monitoring sensors such as door, water, and smoke alarms. These alarms can be named in the interface and easily configured to send email alarms to the user. SNMPv3 is also supported.	None.

ICT PRODUCT SELECTION GUIDE - ICT Distribution Series

		TYPE	OUTPUTS	OPERATING VOLTAGE	GROUND	SYSTEM CURRENT	CURRENT RATING, EACH OUTPUT	4 DIGITAL INPUTS
Unmanaged (Form C provided)	ICT180S-12	Single Bus	12	12/24VDC	Negative	180A	3 x 40A, 9 x 25A	No
	ICT200DF-12	Dual Bus	6 + 6	10-60VDC	Both	200A	25A (12/24V) or 15A (48V)	No
	ICT200DB-12	Dual Bus	6 + 6	10-60VDC	Both	200A	25A (12/24V) or 15A (48V)	No
Remote Monitoring of Panel & Each Output over Ethernet	ICT180S-12I	Single Bus	12	12/24VDC	Negative	180A	3 x 40A, 9 x 25A	Yes
	ICT180S-12B	Single Bus	12	-48VDC	Positive	180A	12 x 15A	Yes
Remote Monitoring and Power Control of Panel & Each Output over Ethernet	ICT180S-12IRC	Single Bus	12	12/24VDC	Negative	180A	3 x 40A, 9 x 25A	Yes
	ICT180S-12BRC	Single Bus	12	-48VDC	Positive	180A	12 x 15A	Yes
	ICT180S-12BRCP	Single Bus	12	+48VDC	Negative	180A	12 x 15A	Yes
	ICT200DF-12IRC	Dual Bus	6 + 6	10-60VDC	Both	200A	25A (12/24V) or 15A (48V)	Yes
	ICT200DB-12IRC	Dual Bus	6 + 6	10-60VDC	Both	200A	25A (12/24V) or 15A (48V)	Yes
	ICT240DB-8IRC	Dual Bus, front access	4 + 4	10-60VDC	Both	240A	12 x 25A (12/24/48V)	Yes