

Selecting Series C Power System

The Series C Power System provides +24 Vdc power to compatible assemblies in one or more cabinet sides.

Series C power system parts

The power systems listed in the following table provide 24Vdc power to compatible assemblies in one or more cabinet sides. Each power system includes the following at a minimum:

- The metal enclosure that holds up to two power supplies and a 24 V backup assembly, if provided.
- An eight-connector interface at the top of the metal enclosure for six 24 Vdc power distribution connectors, one connector interface to C300 Controller memory battery backup assemblies, and one connector interface for power system alarm contacts.

Description	Model or Part Number
Standard Power Systems	
Power System (20A), redundant (2 power supplies), 120/240 VAC, with 24V Backup Battery Assembly	CC-PWRB01 (51199940-100)
Power System (20A), redundant (2 power supplies), 120/240 VAC	CC-PWRR01 (51199939-100)
Power Subsystem (20A), non-redundant (one power supply), 120/240 VAC	CC-PWRN01 (51199937-100)
Spare/Loose Items	
24V Backup Battery Rack (no batteries)	51199945-100
24V Backup Battery Kit (3 batteries and interconnecting cables)	51199946-100
20A Power Supply	51199299-100

Model CC-PWRB01 power system

The model CC-PWRB01 power system has two 24 Vdc (20 amperes) output power supplies for redundancy as well as a 24V backup assembly. The battery backup assembly has rechargeable batteries and battery charger to sustain the 24 Vdc (20 amperes) output for up to 30 minutes in the event of an ac power input failure. Each 24 Vdc power supply can be powered by a separate ac power source (ac line or uninterruptible power supply), if desired. The output is 25 to 26 Vdc (20 amperes) while the ac input is present and 24 to 25 (20 amperes) while the battery backup is available.

Model CC-PWRR01 Power System

The model CC-PWRR01 power system only has two 24 Vdc (20 amperes) output power supplies for redundancy and no 24V backup assembly to sustain the 24 Vdc output in the event of an ac power input failure. Each 24 Vdc power supply can be powered by a separate ac power source (ac line or uninterruptible power supply), if desired. The output is 25 to 26 Vdc (20 amperes) while the ac input is present.

Model CC-PWRN01 power system

The model PWRN01 power system only has a single (non-redundant) 24 Vdc (20 amperes) output power supply and no 24V backup battery assembly to sustain the 24 Vdc output of the power system in the event of ac power input failure. The output is 25 to 26 Vdc (20 amperes) while the ac input is present.

24V Backup Assembly

The 24 V backup assembly consists for one battery rack and one 24 V backup battery kit as described in the previous Series C power system parts section. When a 24V backup assembly is included in a power system installed in a cabinet, the battery rack is installed in the cabinet but the battery kit is shipped separately in a box for field installation.

Power Distribution Subsystem

The power distribution subsystem consists of the hardware listed in the following table to distribute 24 Vdc from a Series C power system to one or more CCAs in one or both sides of a cabinet containing the power system.

Description	Model or Part Number
Power Distribution Subsystem (includes the following parts)	51199406-100
Spare/Loose Parts	
DC Power Cable (connects one of the six 24 Vdc power distribution connectors in the 8-connector interface on the subsystem to the Horizontal DC Power Bus Bar (HDPB)), 9-inches (229 mm) long	51202324-100
Horizontal DC Power Bus Bar (HDPB) (includes mounting hardware)	51403896-100
Pair of Red and Black Conductors (Wires) (provide +24 Vdc and 24 Vdc common from the HDPB to one CCA in a cabinet side. Additional pairs are needed to connect to additional CCAs in the same or opposite cabinet side.)	51202335-300

Horizontal dc power bus bar (HDPB)

The HDPB provides dc power to the tops of up to three (vertical) CCAs (mounted on IOTA Channels) at the top of the cabinet in one cabinet side. the +24 Vdc and 24 Vdc common are provided to IOTAs and their IOMs through two buses (conductors) in each CCA. Each CCA also contains a third bus that serves as a connection point for field wiring shield wires.

If a Series C Power System and HDPB must also power additional CCAs in the other cabinet side of a dual-access cabinet, additional red/black wire pairs (51202335-300) must be added for each vertically-adjacent pair of CCAs in the other cabinet side. The HDPB has three additional terminals for connection of a total of six pairs of red and black wires, so it can support CCAs in both the front and rear sides of a dual-access cabinet, as long as the Power System can provide enough current for both cabinet sides. Otherwise, another Power System and another Power Distribution Subsystem must be used to power the CCAs in the other cabinet side.

C300 Controller Memory Backup

The controller memory backup assembly consists of the following parts and provides up to 50 hours of memory backup to one or two connected C300 Controllers.

Description	Model or Part Number
C300 Memory Backup Assembly (MBA) - For 1 to 2 C300s	CC-SCMB01
C300 Memory Backup Assembly (MBA) - For 2 or more C300s	CC-SCMB02
<i>Spare/Loose Parts</i>	
RAM Charger Assembly	51199932-100
RAM Charger Mounting Assembly (3 inches, 76 mm)	51202340-100
Cable, MBA to one C300 Controller, 30 inches (0.7 m) long	51202330-100
Power cable, MBA to Power System, 55 inches (1.4 m) long	51202331-100
Cable, MBA to one C300 Controller, 84 inches (2 m) long	51202330-200

Memory backup assembly cabling guidelines

- You can use the 30-inch (0.7 meter) long cable to connect the MBA to C300, when the RAM charger mounting assembly is mounted adjacent to its associated C300 IOTA on the same CCA. Use the 84-inch (2 m) long cable when the RAM charger mounting assembly is **not** adjacent to its associated C300 IOTA on the same CCA.
- You can connect up to two C300s to the RAM charger mounting assembly using either the 30-inch (0.7 m) or 84-inch (2 m) long cables, as required.
- The 55-inch (1.4 m) long power cable restricts the mounting location of the MBA to the upper CCA on the left side of a cabinet side adjacent to the Series C power system.

Memory backup hold-up times

The following table lists the hold-up time for a fully charged RAM battery charger depending on the number of C300 Controllers that are connected.

Number of C300s	Hold-Up Time in Hours	Hold-Up Time in Days
1	110	4.58

Series C Hardware Configuration
Series C DC Power Connections

Number of C300s	Hold-Up Time in Hours	Hold-Up Time in Days
2	55	2.23
3	36.6	1.52
4	27.5	1.14

Series C DC Power Connections

The following figure illustrates the typical dc power and battery backup connections made in Series C cabinets. For more information about the components shown in the figure, refer to the previous power system and memory backup sections.

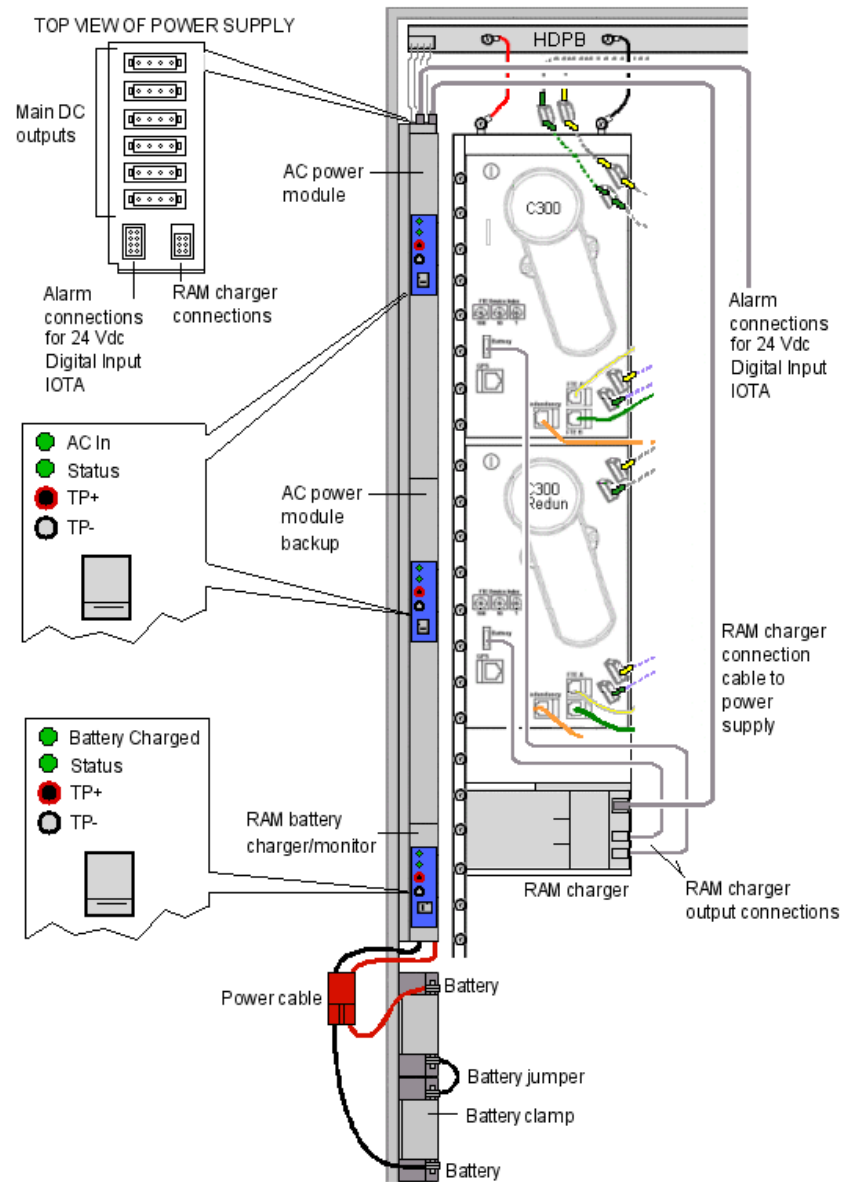


Figure 50 Typical dc power and battery backup connections in Series C cabinet

Series C Power System Indicators

The following table summarizes the Light Emitting Diode (LED) indications provided by the various Series C power system components.

LED Name -Color	LED State		
	<i>OFF</i>	<i>ON</i>	<i>Blinking</i>
AC Power Module Indicators (per supply)			
AC IN - Green	AC input is lost	AC input is within specified range	N/A
Status - Green	<ul style="list-style-type: none"> DC output voltage is out of specifications, A greater current than specified is being pulled from the power supply, and/or Power supply has reached temperatures above specified limits. 	Power supply output is within specified voltage, temperature, and current limits.	Fan has failed. (This indicator must also be off even if a failed fan in one supply is being <i>windmilled</i> by the airflow from the fan in an adjacent supply.)
Main Battery Backup Charger/Regulator/Monitor Indicators			
Status - Green	<ul style="list-style-type: none"> DC input is lost, Battery charger senses an over-voltage on the batteries, Battery charger senses over-current while charging batteries, Battery charger senses an over-temperature condition, Batteries are not 	Power supply output is within the specified voltage, temperature, and current limits.	Fan has failed. (This indicator must also be off even if a failed fan in one supply is being <i>windmilled</i> by the airflow from the fan in an adjacent supply.)

LED Name -Color	LED State		
	present, or <ul style="list-style-type: none"> • Temperature sensor is missing or not connected. 		
Battery Charged - Green	<ul style="list-style-type: none"> • Main battery is missing or discharged, or • Battery is not at the top-off voltage. 	Battery output is capable of supplying the specified output voltage and current for the specified time.	N/A
Ram Battery Backup Charger/Monitor Indicators			
Status - Green	<ul style="list-style-type: none"> • Main battery is missing, or • Battery is not charged yet 	Battery output is capable of supplying the specified output voltage and current for the specified time.	N/A
<p>Note: Alarm opens if :</p> <ul style="list-style-type: none"> • Battery voltage is less than 3.5 volts, • Input voltage to the charger is less than 14 volts, • Battery pack has been removed, or • Battery is still being charged (not in the top-off state). 			

Series C Power System Alarms

Each power supply and the main battery backup regulator/charger, and the RAM battery backup charger provide an alarm contact. The alarm contact opens if any of the LED indicators listed in the previous section are **not** in the normal (ON) state. The alarm contact is electrically isolated from all other circuitry so that it can be series connected by the user with alarms in other devices.

Use a hermetically sealed electromechanical relay. The alarm contacts are rated for 24 volts ac or dc at 0 to 65 mA non-inductive load. An alarm condition is signaled by an open contact (1000 ohms or more); and a no alarm condition is signaled by a closed contact (10 ohms or less).

LLMUX FTAs Mounting Considerations

The LLMUX FTAs are considered as part of a standard Series C system because they work with the LLMUX IOM as shown in the following figure. The LLMUX FTAs receive power from the LLMUX IOTA and can be mounted in one of the following locations.

- In the same cabinet or cabinet complex.
- In a suitable enclosure up to 1,000 feet remote from the LLMUX IOTA with the restriction that the interconnecting cabling between the IOTA and the FTAs must be routed in a manner consistent with national and local electrical code requirements for the environment (Division 2/Zone 2 hazardous location or nonhazardous location) in which it is routed.

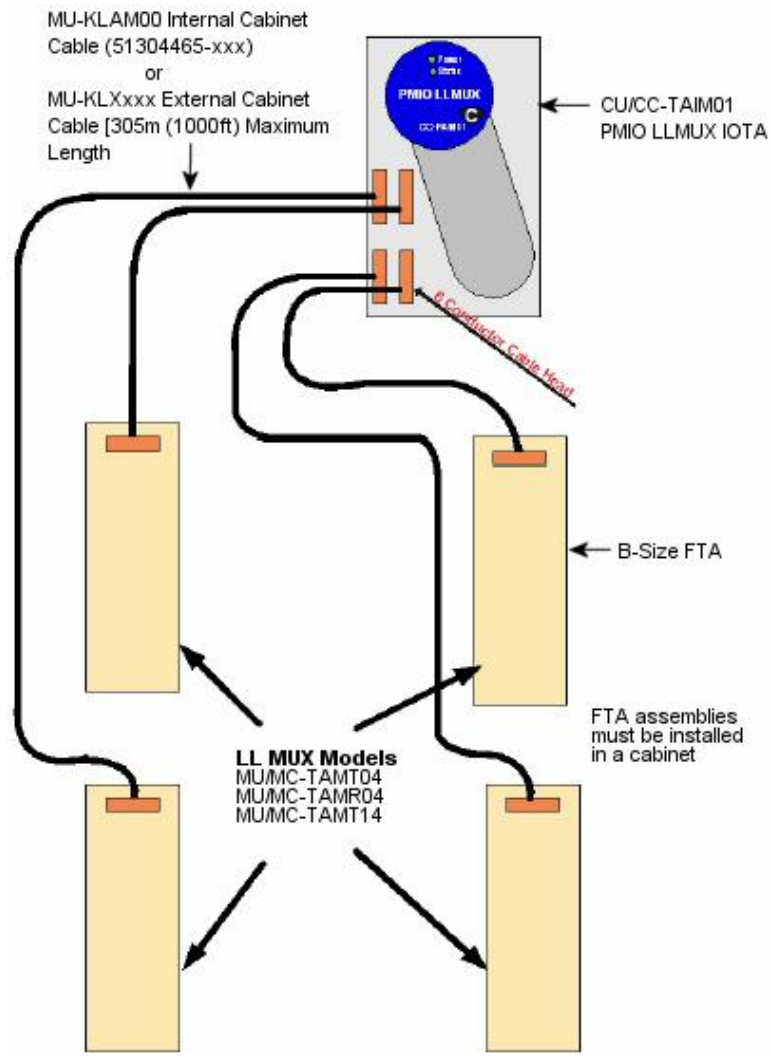


Figure 51 LLMUX FTA used with Series C LLMUX IOTA

Remote CJR installation considerations

The following figure shows the remote CJR installation requirements. You must use the model MU-KRCJ00 cable to connect the remote CJR sensor to the model MC-TAMT14 FTA. Its length is restricted to 50 meters (164 feet). The cable shield must be connected to Safety Ground at both ends of the cable.

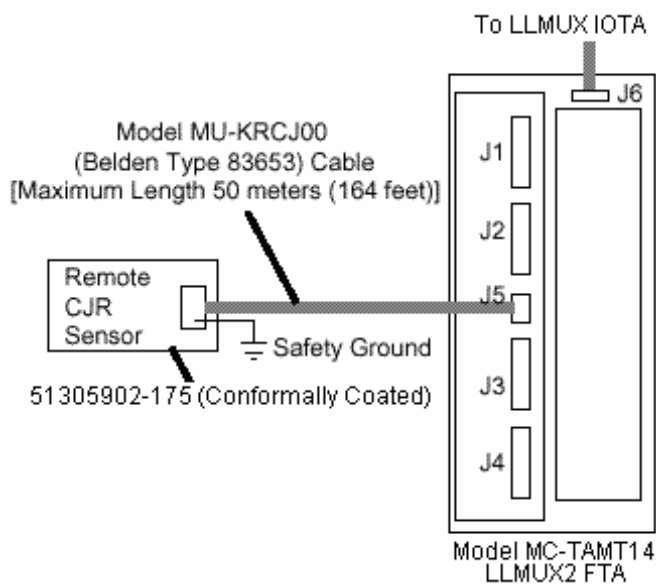




Figure 52 Remote CJR sensor connected to LLMUX2 FTA MC-TAMT14

Series C System Cabling

Cable color coding schemes





The following topics show the color and symbols used for the various cables and connectors used in the Series C system

Ethernet connections

Function	Cable Color	Connector Boot Color	Text	Symbol on IOTA
FTE Link A	White	Yellow	FTEA	
FTE Link B	White	Green	FTEB	
C300 Redundancy	White	Orange	REDUNDANCY	
GPS	White	Black	GPS	

Series C Hardware Configuration
Series C System Cabling

I/O Link Connections

Function	Cable Color	Connector Label Color	Text	Symbol on IOTA
IOLINK1 Link A	Gray	Yellow	IOL1A	
IOLINK Link B	Gray	Green	IOL1B	
IOLINK2 Link A	Violet	Yellow	IOL2A	
IOLINK2 Link B	Violet	Green	IOL2B	
IOLINK 1 Jumper		Gray	(Jumper Number 1 to 40)	
IOLINK 2 Jumper		Violet	(Jumper Number 1 to 40)	

I/O Link Cables

You can connect the following types of I/O Link cables to the redundant I/O Link cable connector ports (IOL1A/B and IOL2A/B) on the C300 Controller IOTA:

- Series C I/O Link (750 KBaud), to support Series C IOMs in their IOTAs
- PM I/O Link (375 KBaud), to support PM IOPs in PM files

Both types always require a pair of cables (Cable A and Cable B). See the previous section about cable color coding schemes.

Series C I/O Link cable types

The following table provides a summary of the types of I/O Link cables that are used in the Series C system.

Cable Name and Type	Description
Header, 3 Drop	<p>The Header cable is a multi-drop cable that distributes the I/O Link horizontally to multiple CCAs in a cabinet side or sides. Header cables can be extended to other header cables. Normally, a header cable runs across the top of the cabinet.</p> <p>This cable can be connected to additional cables of the same type to span cabinet sides with or without extension cables.</p>
Header, 6 Drop	<p>This cable can span two cabinet sides in the front and back of the same cabinet or the same side of adjacent cabinets</p>
Drop, Special	<p>The Drop cable is a multi-drop cable that runs vertically in a CCA. Two drop cables can be plugged together to distribute the I/O Link in a pair of vertical CCAs. The top connector of the topmost drop cable plugs into a connector on the header cable. There are several configurations of drop cables to handle the three different Series C IOTA dimensions [6-inches (152 mm), 9-inches (229 mm) and 12-inches (305 mm)]. There are many situations where a connector on a drop cable is not used. This occurs primarily when there is a mixture of different size IOTAs in a CCA, or the hardware configuration does not fill the CCA.</p> <p>This cable connects C300s to header and bypasses redundant Control Firewalls above.</p>
Drop, 6 Connections on 6-inch Pitch	<p>Use this cable to connect to non redundant HLAI and AO IOTAs, as well as LLAI IOTAs. Since every other connector is on a 12-inch (305 mm) pitch it can also be used with a mix of 6-inch (152 mm) and 12-inch (305 mm) IOTAs.</p>

Series C Hardware Configuration
Series C System Cabling

Description	Model or Part Number
<i>Cable pair consisting of one each of the preceding two cables</i>	51202329-616
Violet Header Cable, 6 drops, yellow label (cable A)	51202329-510
Violet Header Cable, 6 drops, green label (cable B)	51202329-511
<i>Cable pair consisting of one each of the preceding two cables</i>	51202329-512
Violet Drop Cable, 3 drops, for channel containing two CF9s plus two C300s plus one 6-inch (152 mm) IOTA, yellow label (cable A)	51202329-310
Violet Drop Cable, 3 drops, for channel containing two CF9s plus two C300s plus one 6-inch (152 mm) IOTA, green label (cable B)	51202329-311
<i>Cable pair consisting of one each of the preceding two cables</i>	51202329-312
Violet Drop Cable, 3 drops, 12-inch (305 mm) pitch, yellow label (cable A)	51202329-410
Violet Drop Cable, 3 drops, 12-inch (305 mm) pitch, green label (cable B)	51202329-411
<i>Cable pair consisting of one each of the preceding two cables</i>	51202329-412
Violet Drop Cable, 4 drops, 9-inch (229 mm) pitch, yellow label (cable A)	51202329-210
Violet Drop Cable, 4 drops, 9-inch (229 mm) pitch, green label (cable B)	51202329-211
<i>Cable pair consisting of one each of the preceding two cables</i>	51202329-212
Violet Drop Cable, 6 drops, 6-inch (152 mm) pitch, yellow label (cable A)	51202329-110
Violet Drop Cable, 6 drops, 6-inch (152 mm) pitch, green label (cable B)	51202329-111
<i>Cable pair consisting of one each of the preceding two cables</i>	51202329-112
Violet Extension Cable, 9-inches (229 mm) long, yellow label (cable A)	51202329-710
Violet Extension Cable, 9-inches (229 mm) long, green label (cable B)	51202329-711
<i>Cable pair consisting of one each of the preceding two cables</i>	51202329-712
Violet Extension Cable, 25-inches (635 mm) long, yellow label (cable A)	51202329-714
Violet Extension Cable, 25-inches (635 mm) long, green label (cable B)	51202329-715
<i>Cable pair consisting of one each of the preceding two cables</i>	51202329-716