

Application Note

Product: DCT 1900 system
Purpose: Add a cabinet
Date: 3/31/2005

Adding Cabinet to the DCT1900 System

Add a cabinet

Adding a cabinet to an existing system requires planning to assure a successful addition with minimal downtime and problems. Both software and hardware changes need to be made to the existing system during the upgrade procedure.

Read the entire procedure before starting this operation!

There are some special things to take into account for the addition of a cabinet.

- Any cabinet needs to have a minimum of two circuit boards installed in it for the power supply to operate correctly.
- If your new cabinet is ordered with only one circuit board, then you need to plan on moving another circuit board out of an existing cabinet. This may entail moving cables. *Any movement of existing boards should be done after the cabinet is added and the system is back on line.*
- What boards are you placing in the new cabinet and what slots are they going into? *See the section at the end of this document: Recommended board positions.*
- Watch the power consumption totals for the backplane in each cabinet. *See the section at the end of this document: Modular Cabinet Backplane Power Limitations.*
- When am I going to do this? Downtime needs to be scheduled for this operation. Allow plenty of time and let all users know the schedule.
- You will be removing termination resistors and knockout plates. The rule is *“Where two cabinets touch, remove the termination resistors and knockout plates in both cabinets at that point.”*

Pre planning questions

- Where do you physically add the new cabinet? On which side of the existing cabinet(s) do you install the new cabinet?

Examine your current system and compare it to Figure 4-1 in Section 5 of the TPM. Are you adding cabinet 2, or 3, or 4? Plan to add your new cabinet in the location identified in this figure. Make sure the appropriate location on the wall is cleared out for the new cabinet.

- Where will the power supply(s) for the new cabinet be mounted?

Power supplies should not be mounted directly beneath cabinets because the heat from the power supply will rise directly into the cabinet. Mount them off to the side of the cabinets or at least 3 feet below the cabinets.

Application Note

Product: DCT 1900 system
Purpose: Add a cabinet
Date: 3/31/2005

- Where will the additional LTU/CLU/SLU/DTU blocks be mounted?

66 blocks should not be mounted directly beneath the bottom of the cabinets as the blocks will interfere with the drop down bottom of the cabinet and you might short something out on the block. Leave at least a foot or two of free space below the cabinets.

- How will the LTU/CLU/SLU/DTU cables be routed?

All cables coming into or out of the cabinets come out the bottom of the cabinets. Leave enough free space under the cabinets to form and route the cables to their termination points.

The actual operation of adding a cabinet takes place in two steps, before the scheduled down time and during the scheduled down time. Before the scheduled down time you can:

- Prepare the new cabinet.
- Hang the mounting bracket for the new cabinet.

Once this is done and you are at the scheduled down time you can:

- Add the new cabinet via CSM.
- Power down the existing cabinets.
- Mount the new cabinet.
- Power the system back up.
- Testing and backup.

Preparing the new cabinet

Once the new cabinet location has been decided, you must prepare for installation. *For the purpose of this discussion we are adding a second cabinet to an existing one cabinet system.* The following procedure works for this or a third or a fourth cabinet. The only differences will be which side of the back plane and cabinet you will be working with.

We will be adding the second cabinet to the right hand side of cabinet # 1 as you look at cabinet # 1.

- Unpack the new cabinet. Make sure you get the bracket. It is in a plastic bag in the top of the packaging. Once you take the cabinet out of the plastic bag, remove the labels from the back of the cabinet.
- Remove the front cover, bottom plate, and card retention bar. Keep the covers, bar, and screws together.
- Lay the cabinet on its' back and examine the backplane. Since the left side of the new cabinet is going up against cabinet # 1 this is the side we are interested in.
- Locate the (3) termination resistors, R401, R402, and R407 on the backplane. Refer to Figures 4-8 and 4-9 in Section 5 of the TPM. With a pair of needle nose pliers pull the

Application Note

Product: DCT 1900 system
Purpose: Add a cabinet
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- resistor packs up off the sockets on the backplane. **DO THIS CAREFULLY**. Save the resistors.
- Locate the knockout plate on the left side of the new cabinet. Refer to Figure 4-3 in Section 5 of the TPM. Remove this plate. **DO THIS CAREFULLY**. It is recommended that you use a fine tip pair of cutters to cut the plate out.
 - Open the interconnect kit, NTMNB 101 05. Remove (2) of the metal shielding gaskets. Refer to Figure 4-4 in Section 5 of the TPM and install them into the knockout hole on the side of the new cabinet.
 - Place the card slot label along the bottom of the cabinet directly below the card guides.
 - Place the cabinet label along the top edge of the cabinet above the card guides.

At this point it might be a good idea to verify that the power wiring of the cabinet is correct. Take one of the power supplies for the new cabinet and hook it up to the terminal block on the bottom of the cabinet. Refer to Section 5, Chapter 18, Figure 18-2 in the TPM for connection information.

- Turn the power supply on and measure the voltage at the terminal block. The voltage should be –48 volts DC.
- If the voltage is correct turn the cabinet power switch on. Measure the voltage on the terminal block again.
- Turn the cabinet power switch off.
- Insert a circuit board into the cabinet in any slot. Turn the cabinet power switch on. If everything is all right then a green LED at the very top of the circuit board should be lit. Ignore any other LED's.
- Turn off the cabinet power switch and remove the circuit board. Turn off the power supply and disconnect the cabinet power supply.

The new cabinet is ready to be mounted.

Hang the mounting bracket for the new cabinet

Normally the mounting brackets for the cabinets are all mounted at the same time. Since we are adding a cabinet to an existing installation we do not have that luxury. There are two ways to mount the new bracket.

Method 1 – This can only be done when the system is shut down

- When cabinet 1 is shut down, remove it from the bracket on the wall. Use the spacer off of the new bracket, see Figure 4-5 in Section 5 of the TPM, and spot the screw holes for the new bracket.
- Drill holes for the new bracket and secure it to the wall.
- Replace cabinet number 1 on its bracket and secure it to the wall.

Method 2 – Done while existing system is running.

- Measure from the top right hand corner of cabinet number one, 1 7/8 inches over and 7/8 inches down. This is the spot for the left hand mounting bracket screw. Place the

Application Note

Product: DCT 1900 system
Purpose: Add a cabinet
Date: 3/31/2005

- new bracket on the wall, center the left hand mounting hole over the mark you just made, level the bracket, and mark the center of the right hand mounting hole.
- Drill the holes for the screws and secure the bracket to the wall.

Do not mount the new cabinet now!

SCHEDULED DOWN TIME !!!!!

Add the new cabinet via CSM

Before the new cabinet is physically added it must be added in the CSM software.

- Connect the maintenance PC to the system and start the CSM program.
- Back up the existing system.
- Change the authority level to Distributor.
- Go to System – Configuration – System Tab.
- Change the number of cabinets to 2. (2 in our example)
- Click OK.
- Reset the system via CSM or by using the black reset button on the CPU board.
- After the system comes back up, log back on to the system, and verify that it says 2 cabinets.
- Back the system up again. Give the back up a new name.

Power down the existing cabinet(s)

- Power down the existing system.
- Remove any circuit boards in the three slots next to the side of the existing cabinet that is going up against the new cabinet. For our example this would be slots 48, 52, and slot 56. Remember what you pulled out of each slot. Label them.
- Remove the (3) termination resistors, R201, R202, and R207, from the right hand side of the backplane. Refer to Figures 4-8 and 4-9 in Section 5 of the TPM. **DO THIS CAREFULLY**. Save the resistors.
- Remove the knockout plate from the right hand side of the existing cabinet. Refer to Figure 4-3 in Section 5 of the TPM. **DO THIS CAREFULLY**.
- Take the remaining two metal shielding gaskets from the installation kit, NTMNB 101 05, and insert them into the hole where the knock out plate was.

Mount the new cabinet

- Hang the new cabinet on the bracket on the wall. Position it to the right hand side of the bracket. This should give you enough room between the brackets so that the shielding brackets do not interfere with each other as you set the new cabinet against the wall.
- Once the new cabinet is on the bracket, push it up against the existing cabinet as close as possible. This will compress the fingers of the shielding gaskets.

Application Note

Product: DCT 1900 system
Purpose: Add a cabinet
Date: 3/31/2005

- While holding the new cabinet up against the existing cabinet, mark the location of the two mounting holes on the bottom of the new cabinet.
- Drill the holes and secure the new cabinet to the wall with screws.
- Remove the green ground wire from the Installation kit, NTMNB 101 05, and connect it between the grounding plates of the new and existing cabinets. (See Figure 4-7 in Section 5 of the TPM)
- Take the flat ribbon cable from the Installation kit, NTMNB 101 05, and feed it GENTLY through the knock out holes between the cabinets. The connectors on this cable are keyed. Look at the cable before you feed it through. Make sure you have it oriented correctly.
- Gently seat the connectors into the backplane connectors.
- Place the circuit boards that you previously pulled out of the existing cabinet back into the correct slots in the existing cabinet.
- Mount the power supply(s) for the new cabinet.
- Connect the power supply(s) to the cabinet.
- Turn the power supply(s) on and verify the presence and polarity of voltage on the terminal block on the bottom of the cabinet.

If you have not previously tested the cabinet and verified that it powers a board correctly, now is the time to do it.

- Insert a circuit board into the cabinet in any slot. Turn the cabinet power switch on. If everything is all right then a green LED at the very top of the circuit board should be lit. Ignore any other LED's.
- Turn off the cabinet power switch and remove the circuit board.
- Place the circuit board(s) for this cabinet in the correct slot(s).

Powering the system back up

- Turn the power switch for the new cabinet on.
- Turn the power switch for cabinet # 1 on.
- The system should initialize as it did when it was a single cabinet system, but you should see the lights on the card(s) in the second cabinet turn on and off also.
- Connect the maintenance PC to the system and log onto the CSM.
- Verify that the CSM shows the boards in both cabinets.
- Do a system backup. Give it a new name.

Testing and backup

- Verify that all existing portables are working.
- Verify that all existing base stations are working.

Application Note

Product: DCT 1900 system
Purpose: Add a cabinet
Date: 3/31/2005

CPU

The CPU will always reside in Cabinet 1 Slot 24. This is the first slot on the left hand side of the cabinet.

DLU/DTU/LTU

These interface cards will need to reside next to the CPU to ensure proper framing synchronization. When a multi-cabinet configuration is needed, refer to Sec 5, Chapter 3 of the TPM for board positions. All additional interface cards that are installed in cabinets 2-4 need to be placed in the cabinets closest to the CPU.

CLU/SLU

CLU's & SLU's are generally placed on the right hand side of the cabinet. In this position, the CLU/MDF cables do not influence the accessibility of the MCCB.

SPU

SPU's are generally placed in the center of the cabinet.

Application Note

Product: DCT 1900 system
Purpose: Add a cabinet
Date: 3/31/2005

Modular Cabinet Backplane Power Limitations

Modular Cabinet Powering Restrictions

Although the Modular Cabinet has space for 9 boards, not all board combinations are allowed due to power limitations of the DC/DC converter on the backplane. This converter is specified as follows:

+5 V can supply 40 W at maximum
+12 V can supply 12 W at maximum
-12 V can supply 12 W at maximum

Total must be <40 W

Table 1 shows the power consumption per board type. From this table, it can be calculated if a configuration matches the power requirements. The values given to the $\pm 12V$ of the LTU indicates the power consumption in the case where all LTU circuits are off hook.

Board Type	5 V	+12 V	-12 V
CPU-2 REX-BRD9033	6 W		
CPU-2 REX-BRD9034			
CPU REX-BRD0004	9.6 W	1 W	1 W
SPU-S REX-BRD0030	3.55 W		
SLU REX-BRD0026B	6.9 W		
CLU-S REX-BRD0016A	3.45 W		
CLU REX-BRD0014A	3.6 W		
DTU-E1,CCS/CAS REX-BRD0003	4.5 W		
DTU-T1,CAS REX-BRD0021	6 W		
DTU- T1 CCS REX-BRD0025	6 W		
LTU REX-BRD0007A	1.5 W	.75 W	.75 W
LTU-2 REX-BRD0019A	2.5 W		
DLU REX-BRD0023	6.5 W		1.2 W
DLU AWS1024			
DLU AWS1025			
DLU AWS1026			

Table 1 – Power Consumption Per Board Type

Additional Information

If you have any questions about this bulletin, please contact Ascom Technical Services at 1-877-712-7266 option 3.