

5 Installing the BTS3012 Boards and Modules (Capacity Expansion)

About This Chapter

The capacity expansion consists of the hardware installation on the BTS side and the data configuration on the BSC side. After installing hardware on the BTS side, you need to configure data on the LMT on the BSC side. The boards and modules involved in the capacity expansion of the BTS3012 are the DDPU, DCOM, DTRU, DFCU, DFCB, and DELC.

[5.1 Installing the BTS3012/BTS3012AE DDPU \(Capacity Expansion\)](#)

The Dual-Duplexer Unit for DTRU BTS (DDPU) of the BTS3012/BTS3012AE is in the Antenna Front-end Unit for DTRU BTS (DAFU). If the cells or the TRXs in the BTS require capacity expansion, you need to add DDPUs. Adding DDPUs disrupts the services carried by the BTS.

[5.2 Installing the BTS3012/BTS3012AE DCOM \(Capacity Expansion\)](#)

The Combining unit for DTRU BTS (DCOM) of the BTS3012/BTS3012AE is in the Antenna Front-end Unit for DTRU BTS (DAFU). If the cells in the BTS require capacity expansion or there are more than four TRXs in a cell, you may need to add DCOMs. Adding DCOMs disrupts the services carried by the BTS.

[5.3 Installing the BTS3012/BTS3012AE DTRU \(Capacity Expansion\)](#)

The Double-Transceiver Unit (DTRU) of the BTS3012/BTS3012AE is in the DTRU subrack. When TCHs are congested because the BTS traffic volume rises, or TRXs require capacity expansion, you need to add DTRUs. Adding DTRUs disrupts the services carried by the BTS.

[5.4 Installing the BTS3012/BTS3012AE DFCU \(Capacity Expansion\)](#)

The Filter Combiner Unit for DTRU BTS (DFCU) of the BTS3012/BTS3012AE is in the Antenna Front-end Unit for DTRU BTS (DAFU). If the cells or the TRXs in the BTS require capacity expansion, you may need to add DFCUs. Adding DFCUs disrupts the services carried by the BTS.

[5.5 Installing the BTS3012/BTS3012AE DFCB \(Capacity Expansion\)](#)

The Filter Combiner Unit for DTRU BTS type B (DFCB) of the BTS3012/BTS3012AE is in the Antenna Front-end Unit for DTRU BTS (DAFU). If the cells or the TRXs in the BTS require capacity expansion, you may need to add DFCBs. Adding DFCBs disrupts the services carried by the BTS.

[5.6 Installing the BTS3012 DELC \(Capacity Expansion\)](#)

The E1 signal Lightning-protection Card for DTRU BTS (DELIC) of the BTS3012 cabinet is in the signal lightning-protection subrack on the top of the cabinet. When the BTS requires TRX capacity expansion (The number of TRXs exceeds the capacity of the four E1 cables for the DELIC), or the onsite BTS networking uses multi-BTS tree topology, you need to add DELICs. Adding DELICs disrupts the services carried by the BTS.

5.1 Installing the BTS3012/BTS3012AE DDPU (Capacity Expansion)

The Dual-Duplexer Unit for DTRU BTS (DDPU) of the BTS3012/BTS3012AE is in the Antenna Front-end Unit for DTRU BTS (DAFU). If the cells or the TRXs in the BTS require capacity expansion, you need to add DDPUs. Adding DDPUs disrupts the services carried by the BTS.

Prerequisite

- You have obtained the status of the board or the module and the information about the corresponding slot.
- You have confirmed the types and number of the required boards or modules as well as the subrack and slots where the boards or modules are located.
- The hardware versions of new boards or modules are correct.
- If the boards or modules have DIP switches on them, ensure that the settings of the DIP switches are correct.
- You have arranged the key to the front cabinet door and other required tools, such as a #2 cross screwdriver, cable straps, and labels.
- The required material has been delivered on site.

Context

The capacity expansion takes about 20 minutes.

The DDPU is heavy. Handle it carefully.



CAUTION

Take correct ESD prevention measures, such as wearing an ESD wrist strap or ESD gloves, to avoid static damage to boards, modules, and electronic components.



CAUTION

After the operation, remove the ESD wrist strap, arrange its line, and place it on the zig strap of the air filter inside the door of the cabinet. Confirm that the cables and parts are in position. The ESD wrist strap must not be connected to the ESD jack when you close the door. Otherwise, the door will get stuck by the ESD wrist strap and the ESD wrist strap or the cabinet door will be damaged.

Procedure

Step 1 **Change the management state of the BTS.** Block all the DTRUs in the cabinet.

Step 2 Power off the DAFU subrack.

If...	Then...
The power-off is performed in the BTS3012	Set the MCB DAFU on the busbar to OFF.
The power-off is performed in the BTS3012AE	Set the MCB DAFU on the DC power distribution box to OFF.

Step 3 Install a new DDPU.**WARNING**

The screws on the DDPU must be secure to ensure the current discharging function of the DDPU. If the screws are not secure, the DDPU cannot fully perform the lightning protection function. Therefore, the equipment cannot work reliably.

Step 4 Install cables to the panels of the new DDPUs.

1. Install power cables.
 - a. Remove the dustproof caps of the power cables for DDPUs.
 - b. Install the power cables to the POWER ports on the panels of DDPUs.
 - c. Screw the two fastening bolts on each cable connector.
 - d. Place the removed dustproof caps under the cabinet for future use.
2. Install RF cables.

Install RF cables according to the BTS configurations. The installation consists of **installing the RF signal cables** and **installing the indoor 1/2-inch jumpers**.

Step 5 Attach the cell labels to the panels of new DDPUs.**Step 6** Power on the DAFU subrack.

If...	Then...
The power-off is performed in the BTS3012	Set the MCB DAFU on the busbar to ON.
The power-off is performed in the BTS3012AE	Set the MCB DAFU on the DC power distribution box to ON.

Step 7 Configure BTS data on the LMT. **Configure the DDPUs** in the related slots.**Step 8** **Query the information of BTS boards**. If the software version does not match the current BTS version, perform **software loading** and **software activation** for the new DDPUs.**Step 9** Confirm the BTS data configuration, as shown in **Figure 5-1**.

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
2					D							D									D			
					D							D									D			
					P							P									P			
					U							U									U			
1				T								T	T								T	T		
				R								R	R								R	R		
				U								U	U								U	U		
0	D						N									D	D							
	T						F									H	P							
	M						C									E	M							
	U						B									U	U							

---End

After the capacity expansion, verify the following:

1. The modules are tightly inserted.
2. The status of the module indicators is normal.
3. **Query the information of BTS boards.** Ensure that the software is correctly loaded.
 - (1) If the software version is not correct, reload the software on the LMT and activate it.
 - (2) If the software version is correct, go to the next step.
4. Module alarms have disappeared.
5. The modules are running normally.

The Combining unit for DTRU BTS (DCOM) of the BTS3012/BTS3012AE is in the Antenna Front-end Unit for DTRU BTS (DAFU). If the cells in the BTS require capacity expansion or there are more than four TRXs in a cell, you may need to add DCOMs. Adding DCOMs disrupts the services carried by the BTS.

Prerequisite

- You have obtained the status of the board or the module and the information about the corresponding slot.
- You have confirmed the types and number of the required boards or modules as well as the subrack and slots where the boards or modules are located.
- The hardware versions of new boards or modules are correct.
- If the boards or modules have DIP switches on them, ensure that the settings of the DIP switches are correct.
- You have arranged the key to the front cabinet door and other required tools, such as a #2 cross screwdriver, cable straps, and labels.
- The required material has been delivered on site.

**NOTE**

You have collected the traffic statistics for the analysis of the related parameters after capacity expansion.

Context

The capacity expansion takes about 20 minutes.

**CAUTION**

Take correct ESD prevention measures, such as wearing an ESD wrist strap or ESD gloves, to avoid static damage to boards, modules, and electronic components.

**CAUTION**

After the operation, remove the ESD wrist strap, arrange its line, and place it on the zig strap of the air filter inside the door of the cabinet. Confirm that the cables and parts are in position. The ESD wrist strap must not be connected to the ESD jack when you close the door. Otherwise, the door will get stuck by the ESD wrist strap and the ESD wrist strap or the cabinet door will be damaged.

Procedure

Step 1 **Change the management state of the BTS.** Block all the DTRUs in the cabinet.

Step 2 Power off the DAFU subrack.

If...	Then...
The power-off is performed in the BTS3012	Set the MCB DAFU on the busbar to OFF.
The power-off is performed in the BTS3012AE	Set the MCB DAFU on the DC power distribution box to OFF.

Step 3 Install new DCOMs.

Step 4 Install cables to the panels of the new DCOMs.

Install RF cables and signal cables according to the BTS configurations. The installation consists of installing RF transmit signal cables and installing the signal cable between the DCTB and the DAFU.

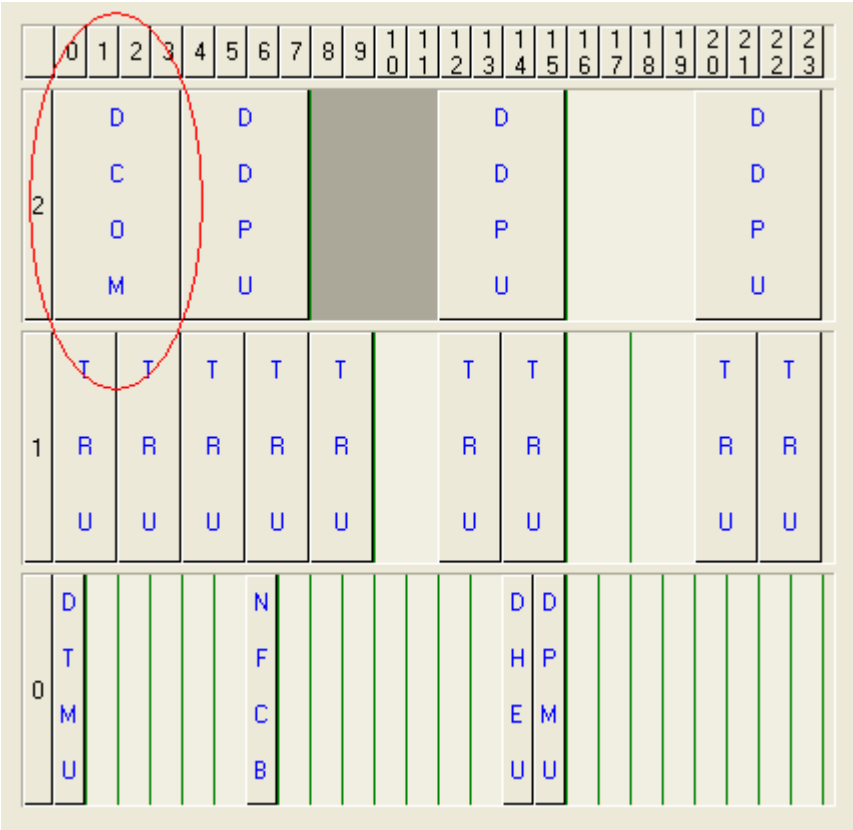
Step 5 Power on the DAFU subrack.

If...	Then...
The power-off is performed in the BTS3012	Set the MCB DAFU on the busbar to ON.
The power-off is performed in the BTS3012AE	Set the MCB DAFU on the DC power distribution box to ON.

Step 6 Configure BTS data on the LMT. Configure the DCOMs in the related slots.

Step 7 Confirm the BTS data configuration, as shown in Figure 5-2.

Figure 5-2 Data Configuration of the DCOM



Step 8 Change the management state of the BTS. Unblock all the DTRUs in the cabinet.

----End

Postrequisite

After the capacity expansion, verify the following:

1. The modules are tightly inserted.
2. The status of the module indicators is normal.
3. Module alarms have disappeared.
4. The modules are running normally.

5.3 Installing the BTS3012/BTS3012AE DTRU (Capacity Expansion)

The Double-Transceiver Unit (DTRU) of the BTS3012/BTS3012AE is in the DTRU subrack. When TCHs are congested because the BTS traffic volume rises, or TRXs require capacity expansion, you need to add DTRUs. Adding DTRUs disrupts the services carried by the BTS.

Prerequisite

- You have obtained the status of the board or the module and the information about the corresponding slot.
- You have confirmed the types and number of the required boards or modules as well as the subrack and slots where the boards or modules are located.
- The hardware versions of new boards or modules are correct.
- If the boards or modules have DIP switches on them, ensure that the settings of the DIP switches are correct.
- You have arranged the key to the front cabinet door and other required tools, such as a #2 cross screwdriver, cable straps, and labels.
- The required material has been delivered on site.

Context

The capacity expansion takes about 20 minutes.



CAUTION

Take correct ESD prevention measures, such as wearing an ESD wrist strap or ESD gloves, to avoid static damage to boards, modules, and electronic components.



CAUTION

After the operation, remove the ESD wrist strap, arrange its line, and place it on the zig strap of the air filter inside the door of the cabinet. Confirm that the cables and parts are in position. The ESD wrist strap must not be connected to the ESD jack when you close the door. Otherwise, the door will get stuck by the ESD wrist strap and the ESD wrist strap or the cabinet door will be damaged.

Procedure

Step 1 Switch off the related DTRUs.

If...	Then...
The power-off is performed in the BTS3012	Set the MCB TRX on the busbar to OFF.
The power-off is performed in the BTS3012AE	Set the MCB DTRU on the DC power distribution box to OFF.

Step 2 [Install new DTRUs](#).

Step 3 Install cables to the panels of the new DTRUs.

1. Install power cables.
 - a. Remove the dustproof caps of the power cables for DTRUs.
 - b. Install the power cables to the POWER ports on the panels of DTRUs.
 - c. Screw the two fastening bolts on each cable connector.
 - d. Place the removed dustproof caps under the cabinet for future use.
2. Install RF cables and signal cables.

Install RF cables and signal cables according to the BTS configurations. The installation consists of [installing RF RX signal cables](#) and [installing the cables for combiners on DTRUs](#).

Step 4 Switch on the DTRUs.

If...	Then...
The power-off is performed in the BTS3012	Set the MCB TRX on the busbar to ON.
The power-off is performed in the BTS3012AE	Set the MCB DTRU on the DC power distribution box to ON.

Step 5 Configure BTS data on the LMT. [Configure DTRUs](#) in the related slots by adding TRXs.

Step 6 [Query the information of BTS boards](#). If the software version does not match the current BTS version, perform [software loading](#) and [software activation](#) for the new DTRUs.

Step 7 Confirm the BTS data configuration, as shown in [Figure 5-3](#).

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
2						D								D								D		
						D								D								D		
						P								P								P		
						U								U								U		
1						T								T	T							T	T	
						R								R	R							R	R	
						U								U	U							U	U	
0	D							N							D	D								
	T							F							H	P								
	M							C							E	M								
	U							B							U	U								

Postrequisite

1. The modules are tightly inserted.
2. The status of the module indicators is normal.
3. **Query the information of BTS boards.** Ensure that the software is correctly loaded.
 - (1) If the software version is not correct, reload the software on the LMT and activate it.
 - (2) If the software version is correct, go to the next step.
4. Module alarms have disappeared.
5. The modules are running normally.

5.4 Installing the BTS3012/BTS3012AE DFCU (Capacity Expansion)

The Filter Combiner Unit for DTRU BTS (DFCU) of the BTS3012/BTS3012AE is in the Antenna Front-end Unit for DTRU BTS (DAFU). If the cells or the TRXs in the BTS require capacity expansion, you may need to add DFCUs. Adding DFCUs disrupts the services carried by the BTS.

Prerequisite

- You have obtained the status of the board or the module and the information about the corresponding slot.
- You have confirmed the types and number of the required boards or modules as well as the subrack and slots where the boards or modules are located.
- The hardware versions of new boards or modules are correct.
- If the boards or modules have DIP switches on them, ensure that the settings of the DIP switches are correct.
- You have arranged the key to the front cabinet door and other required tools, such as a #2 cross screwdriver, cable straps, and labels.
- The required material has been delivered on site.

Context

The capacity expansion takes about 20 minutes.

Handle the DFCU carefully.



CAUTION

Take correct ESD prevention measures, such as wearing an ESD wrist strap or ESD gloves, to avoid static damage to boards, modules, and electronic components.



CAUTION

After the operation, remove the ESD wrist strap, arrange its line, and place it on the zig strap of the air filter inside the door of the cabinet. Confirm that the cables and parts are in position. The ESD wrist strap must not be connected to the ESD jack when you close the door. Otherwise, the door will get stuck by the ESD wrist strap and the ESD wrist strap or the cabinet door will be damaged.

Procedure

Step 1 **Change the management state of the BTS.** Block all the DTRUs in the cabinet.

Step 2 Power off the DAFU subrack.

If...	Then...
The power-off is performed in the BTS3012	Set the MCB DAFU on the busbar to OFF.
The power-off is performed in the BTS3012AE	Set the MCB DAFU on the DC power distribution box to OFF.

Step 3 **Install new DFCUs.**

Step 4 Install cables to the panels of the new DFCUs.

1. Install power cables.
 - a. Remove the dustproof caps of the power cables for DFCUs.
 - b. Install the power cables to the POWER ports on the panels of DFCUs.
 - c. Screw the two fastening bolts on each cable connector.
 - d. Place the removed dustproof caps under the cabinet for future use.
2. Install RF cables and signal cables.

Install RF cables and signal cables according to the BTS configurations. The installation consists of **installing RF TX signal cables**, **installing RF RX signal cables**, **installing power detection cables**, **installing four-in-one short-circuiting cables**, **installing diversity receive short-circuiting cables**, and **installing indoor 1/2-inch jumpers**.

Step 5 Attach the cell labels to the panels of new DFCUs.**Step 6** Power on the DAFU subrack.

If...	Then...
The power-off is performed in the BTS3012	Set the MCB DAFU on the busbar to ON.
The power-off is performed in the BTS3012AE	Set the MCB DAFU on the DC power distribution box to ON.

Step 7 Configure BTS data on the LMT. **Configure DFCUs** in the related slots.**Step 8** **Query the information of BTS boards**. If the software version does not match the current BTS version, perform **software loading** and **software activation** for the new DFCUs.**Step 9** Confirm the BTS data configuration, as shown in **Figure 5-4**.

Figure 5-4 Data Configuration of the DFCU

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
2		D								D								D						
		F								F								F						
		C								C								C						
		U								U								U						
1		T	T	T	T					T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
		R	R	R	R					R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
		U	U	U	U					U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
0	D									N														
	T									F														
	M									C														
	U									B														

Step 10 **Change the management state of the BTS.** Unblock all the DTRUs in the cabinet.
----End

Postrequisite

- After the capacity expansion, verify the following:
- 1. The modules are tightly inserted.
 - 2. The status of the module indicators is normal.
 - 3. **Query the information of BTS boards.** Ensure that the software is correctly loaded.
 - (1) If the software version is not correct, reload the software on the LMT and activate it.
 - (2) If the software version is correct, go to the next step.
 - 4. Module alarms have disappeared.
 - 5. The modules are running normally.

5.5 Installing the BTS3012/BTS3012AE DFCB (Capacity Expansion)

The Filter Combiner Unit for DTRU BTS type B (DFCB) of the BTS3012/BTS3012AE is in the Antenna Front-end Unit for DTRU BTS (DAFU). If the cells or the TRXs in the BTS require capacity expansion, you may need to add DFCBs. Adding DFCBs disrupts the services carried by the BTS.

Prerequisite

- You have obtained the status of the board or the module and the information about the corresponding slot.
- You have confirmed the types and number of the required boards or modules as well as the subrack and slots where the boards or modules are located.
- The hardware versions of new boards or modules are correct.
- If the boards or modules have DIP switches on them, ensure that the settings of the DIP switches are correct.
- You have arranged the key to the front cabinet door and other required tools, such as a #2 cross screwdriver, cable straps, and labels.
- The required material has been delivered on site.

Context

The capacity expansion takes about 20 minutes.

DFCBs are cascaded with DFCUs during the capacity expansion of the DFCU.

The DFCB is heavy. Handle it carefully.



CAUTION

Take correct ESD prevention measures, such as wearing an ESD wrist strap or ESD gloves, to avoid static damage to boards, modules, and electronic components.



CAUTION

After the operation, remove the ESD wrist strap, arrange its line, and place it on the zig strap of the air filter inside the door of the cabinet. Confirm that the cables and parts are in position. The ESD wrist strap must not be connected to the ESD jack when you close the door. Otherwise, the door will get stuck by the ESD wrist strap and the ESD wrist strap or the cabinet door will be damaged.

Procedure

Step 1 **Change the management state of the BTS.** Block all the DTRUs in the cabinet.

Step 2 Power off the DAFU subrack.

If...	Then...
The power-off is performed in the BTS3012	Set the MCB DAFU on the busbar to OFF.
The power-off is performed in the BTS3012AE	Set the MCB DAFU on the DC power distribution box to OFF.

Step 3 Install new DFCBs.

Step 4 Install cables to the panels of the new DFCBs.

1. Install power cables.
 - a. Remove the dustproof caps of the power cables for DFCBs.
 - b. Install the power cables to the POWER ports on the panels of DFCBs.
 - c. Screw the two fastening bolts on each cable connector.
 - d. Place the removed dustproof caps under the cabinet for future use.
2. Install RF cables and signal cables.

Install RF cables and signal cables according to the BTS configurations. The installation consists of **installing BTS3012/BTS3012AE signal cables between the DFCB and the DFCU**, **installing RF TX signal cables**, **installing RF RX signal cables**, **installing power detection cables**, **installing four-in-one short-circuiting cables**, **installing diversity receive short-circuiting cables**, and **installing indoor 1/2-inch jumpers**.

Step 5 Attach the cell labels to the panels of new DFCBs.

Step 6 Power on the DAFU subrack.

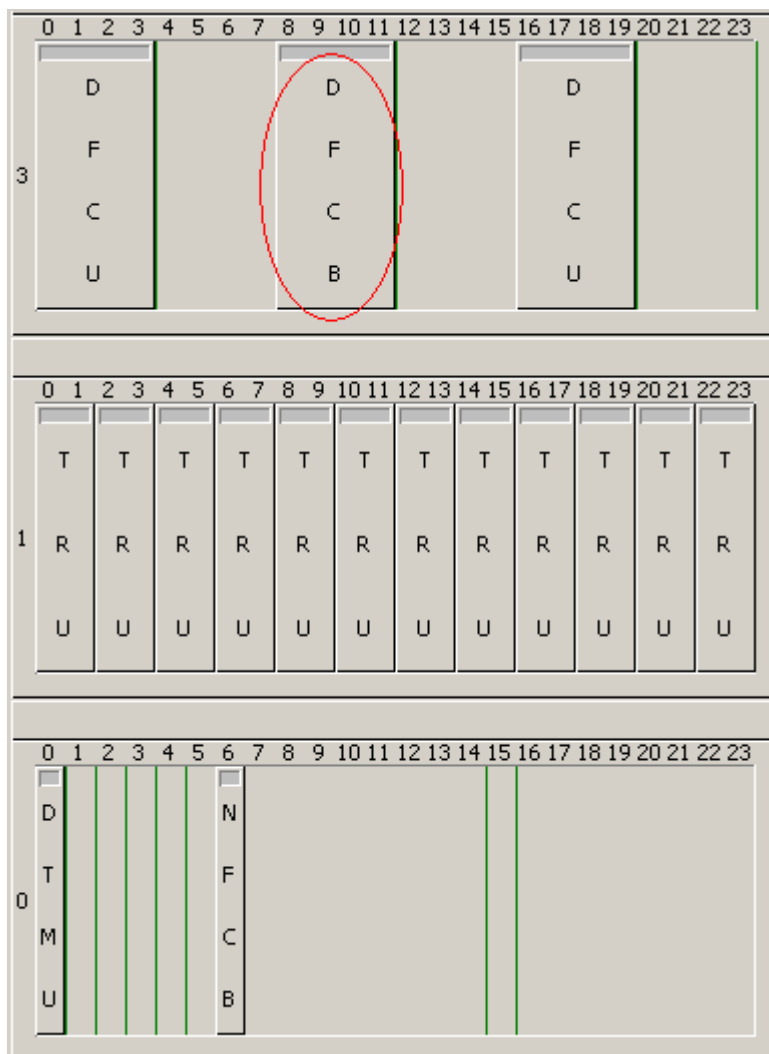
If...	Then...
The power-off is performed in the BTS3012	Set the MCB DAFU on the busbar to ON.
The power-off is performed in the BTS3012AE	Set the MCB DAFU on the DC power distribution box to ON.

Step 7 Configure BTS data on the LMT. **Configuring DFCBs** in the related slots.

Step 8 **Query the information of BTS boards**. If the software version does not match the current BTS version, perform **software loading** and **software activation** for the new DFCBs.

Step 9 Confirm the BTS data configuration, as shown in **Figure 5-5**.

Figure 5-5 Data configuration of the DFCB



Step 10 **Change the management state of the BTS.** Unblock all the DTRUs in the cabinet.

----End

Postrequisite

After the capacity expansion, verify the following:

1. The modules are tightly inserted.
2. The status of the module indicators is normal.
3. **Query the information of BTS boards.** Ensure that the software is correctly loaded.
 - (1) If the software version is not correct, reload the software on the LMT and activate it.
 - (2) If the software version is correct, go to the next step.
4. Module alarms have disappeared.
5. The modules are running normally.

5.6 Installing the BTS3012 DELC (Capacity Expansion)

The E1 signal Lightning-protection Card for DTRU BTS (DELC) of the BTS3012 cabinet is in the signal lightning-protection subrack on the top of the cabinet. When the BTS requires TRX capacity expansion (The number of TRXs exceeds the capacity of the four E1 cables for the DELC), or the onsite BTS networking uses multi-BTS tree topology, you need to add DELCs. Adding DELCs disrupts the services carried by the BTS.

Prerequisite

- You have obtained the status of the board or the module and the information about the corresponding slot.
- You have confirmed the types and number of the required boards or modules as well as the subrack and slots where the boards or modules are located.
- The hardware versions of new boards or modules are correct.
- If the boards or modules have DIP switches on them, ensure that the settings of the DIP switches are correct.
- You have arranged the key to the front cabinet door and other required tools, such as a #2 cross screwdriver, cable straps, and labels.
- The required material has been delivered on site.

Context

The capacity expansion takes about 10 minutes.



CAUTION

- If you may touch the cabinet (including boards, modules, cables, and components in the cabinet) in an operation, wear an ESD wrist strap and correctly ground it.
- When installing boards, do not touch PCBs or components except jumpers and DIP switches.
- Because the captive screws on the boards in the common subrack are M3 screws, use a #2 cross screwdriver (diameter: 6 mm) when loosen or tighten the screws. If you do not know the type of the cross screwdriver, try different cross screwdrivers starting from the one with the greatest diameter until you find a suitable one. Do not use the screwdriver smaller than the #2 cross screwdriver.



CAUTION

After the operation, remove the ESD wrist strap, arrange its line, and place it on the zig strap of the air filter inside the door of the cabinet. Confirm that the cables and parts are in position. The ESD wrist strap must not be connected to the ESD jack when you close the door. Otherwise, the door will get stuck by the ESD wrist strap and the ESD wrist strap or the cabinet door will be damaged.

Procedure

Step 1 [Install new DELCs.](#)

Step 2 [Install E1 cables.](#)



NOTE

If you add a site in cascading mode (cascading through E1s of the DELC), you have to configure the port relation between the new site and its upper-level site.

----End

Postrequisite

After the capacity expansion, verify the following:

1. E1 cables are correctly installed.
2. The grounding status of the E1 cables is correct.
3. The E1 related alarms on the Site Maintenance Terminal System are cleared.