

N-brick Overview

The N brick provides up to four direct Crosstalk connections between various C bricks and G bricks in a multipipe Onyx 3000 series system. Refer to Figure 1.



Figure 1 C brick to G brick Diagram

The N brick contains four Xbridge ASICs that provide eight 400-MHz 16-bit differential XIO ports. The four Xbridge ASICs reside on the 4 null boards that are identified as SLOT_ID 00, 01, 10, 11 from bottom to top. Boards 0 and 2 sit upright while Boards 1 and 3 are placed upside down. The N brick has no other I/O capabilities.

The N brick is intended for the SGI Onyx 3400 and SGI Onyx 3800 systems.

The N brick is a physically standard SGI Onyx 3000 series system component and requires 2U of space within the rack. The standard LEDs (service, failure, and power) are visible on the front of the brick. The L1 LCD display is positioned above the LEDs. Refer to Figure 2.



Figure 2 N-brick Front View

The rear of the N brick contains the 48-Vdc and 12-Vdc LEDs, the 21-pin power cord connection, and the On/Off toggle switch. Additionally, the eight DNET connectors, four C-brick connections and four IR-graphics connections are accessible from the rear of the brick. Refer to Figure 3.

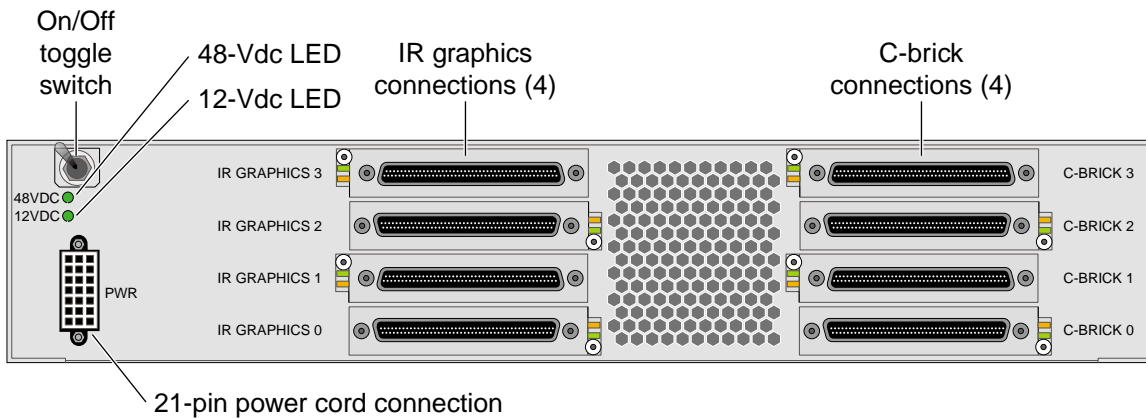


Figure 3 N-brick Rear View

The physical specifications of the N brick are listed in Table 1.

Table 1 N-brick Specifications

Characteristic	Specification
Height	3.3 in. (83.82 cm.)
Width	17.38 in. (441.45 cm.)
Depth	27.5 in. (699.60 cm.)
Weight	20 lb. (9 kg.)

Operating System Requirements

The N brick requires an upgrade to the operating system. Prior to the installation of an N brick, upgrade the IRIX operating system to level 6.5.13 or later.

Components

The N brick contains the following components:

- Four Xbridge null boards
- Power board
 - Voltage regulator modules
 - Power inlet board
- L1 controller
- Fans

Null Board

Each N-brick null board contains one Xbridge ASIC. The ASIC supports two 800-MB/s differential XIO DNET connector ports (A and B). Ports 8, 9, C, D, E, and F are logically disconnected. Refer to Figure 4 and Figure 5.

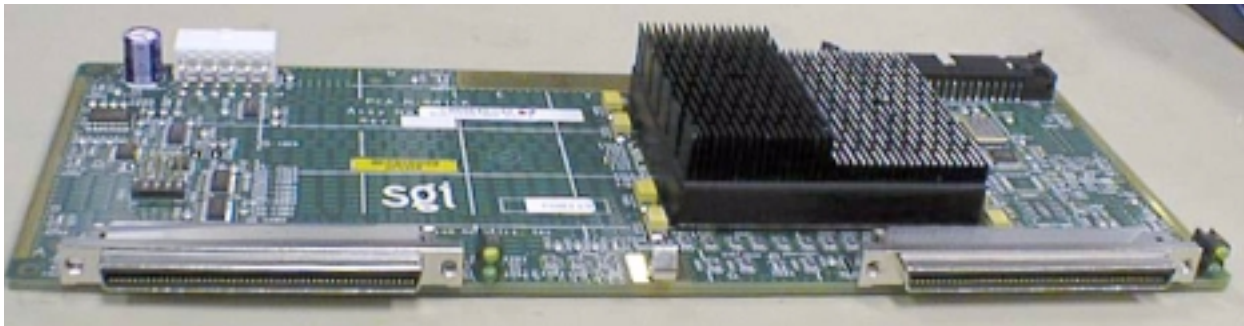


Figure 4 Null Board

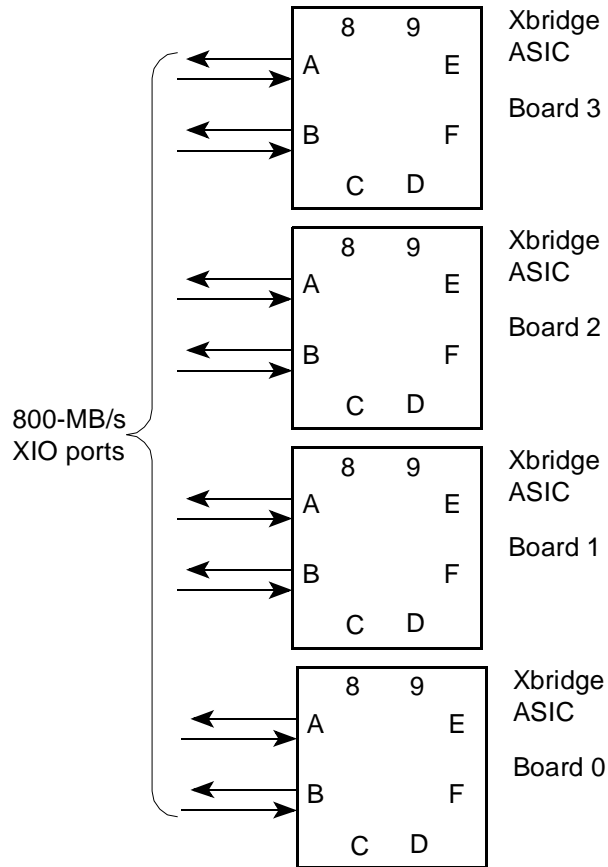


Figure 5 N-brick Logical Block Diagram

Power Board

The power input board connects to the power board. The power board contains VRMs that convert 48-Vdc incoming power to voltage levels that the brick requires:

- 2.5 Vdc
- 3.3 Vdc
- 12 Vdc

Additionally, the power board also contains the L1 controller. Refer to Figure 6.

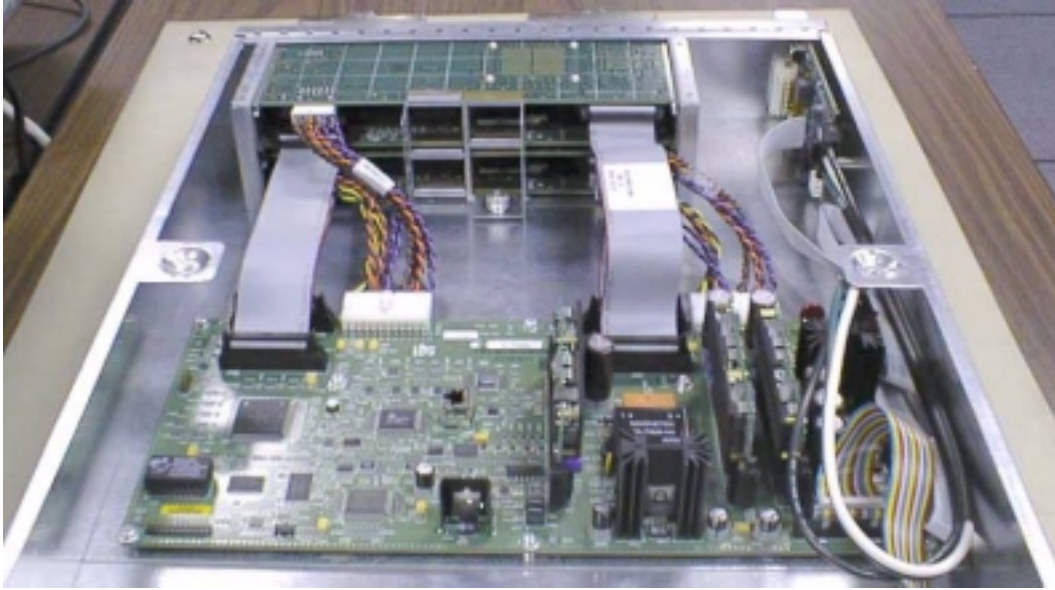


Figure 6 Power Board with Voltage Regulator Modules

L1 System Controller

After the N brick is installed, flash the L1 controller software for **all** bricks to firmware level 1.6.0 or later.

The L1 controller monitors and controls the following N-brick environments:

- Operating temperature
- Voltage margins
- System LEDs

The L1 controller reads component information from serial ID EEPROMs, provides a console connection, and interfaces with its own 2-line x 12-character LCD. The L1 controller consists of the display, logic components, and display cable. The logic components are located on the power board.

The L1 controller of the N brick communicates with an L2 controller by using the internal RS-422 cable connection in the DNET cable. Even though there can be up to four C-brick connections, no one C brick is designated as Master. The L1 controller interprets communication signals from any of the four C bricks.

Fans

The front of the N brick contains two cooling fans, which are N+1 redundant and can be hot swapped. Refer to Figure 7.

Note: Because all other bricks have three fans, the fan molding of the N brick is designed to look like it has three fans. The middle and right fans are functional. The left fan is not functional.



Figure 7 N-brick Fans

Configurations

The N brick contains four Xbridge null boards that are identified by SLOT_ID_00, SLOT_ID_01, SLOT_ID_10, and SLOT_ID_11 from bottom to top. Boards 0 and 2 sit upright while boards 1 and 3 are placed upside down. I/O connectivity is through high-speed Xtown2 or XIO links. XIO cables attach to the C brick's II DNET connector and the right side of the N brick while the IR Graphics cables connect to the left side and to the Xtown2 connections on the G brick. Refer to Figure 8.

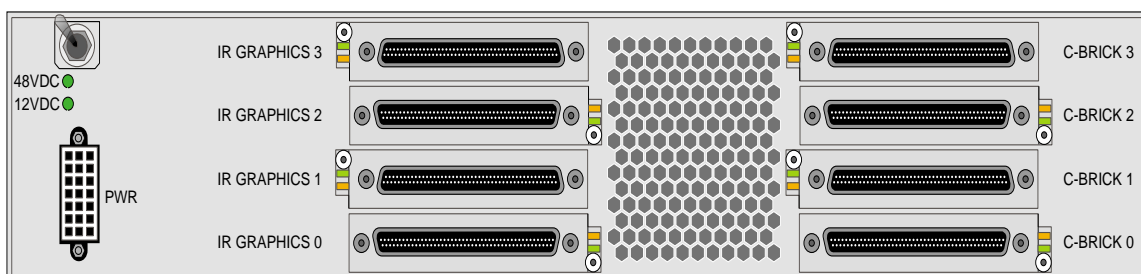


Figure 8 N-brick Connector View

The maximum XIO cable length is 4 meters.

Field Upgrades - Brick Positioning

In general, configure I/O racks according to the following guidelines.

- Place bricks in the rack in the following order:
 1. All I bricks
 2. All N bricks
 3. All P bricks
 4. All X bricks

- Position the bricks in the rack as follows:
 1. Place the first brick (an I brick, if applicable) in the middle of the rack at slot U18.
 2. Place the next brick *below*, and adjacent to, the first brick. (If applicable, this is another I brick. Otherwise, insert the next brick according to the ordering scheme described above.)
 3. Place the next brick *above*, and adjacent to, the first brick.
 4. Alternate from the bottom to top as you insert other bricks, filling the rack from the middle outward.

Note: Maximum cable length is 4 meters.

An N brick cannot be placed in a rack that contains two G bricks. However, an N brick can be placed in an I/O rack that contains one G brick.

Figure 9 shows the configuration of an Onyx 3400 system with seven C bricks and seven G bricks.

For configuration details, refer to the *SGI Onyx 3000 Configuration Rules* at http://wwwcf.americas.sgi.com/PUBLIC/tech_pub/

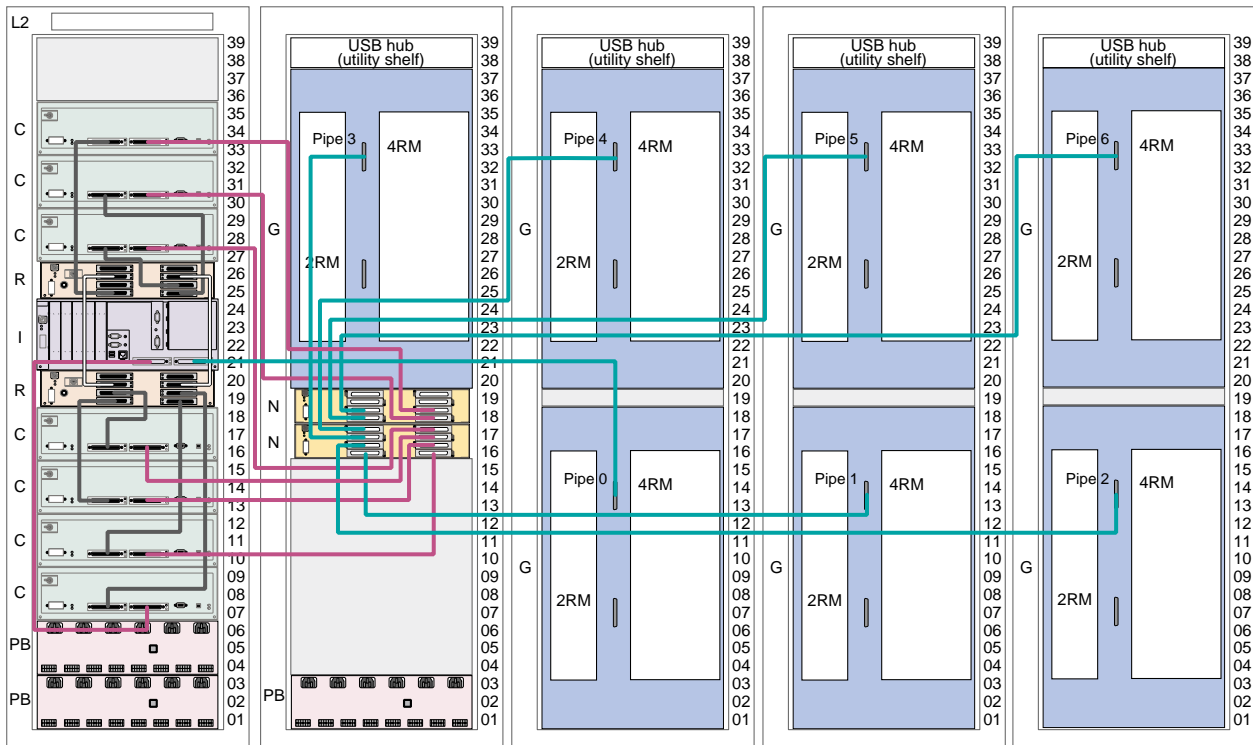


Figure 9 Onyx 3400 with N-brick Connections

Spares

The system must be powered down during all maintenance activities of the N brick except fan replacement.

The N-brick spares include the following components:

- 013-3186-002 - Enclosure Assembly
- 030-1665-003 - PCA Null Board
- 030-1737-001 - PCA Power
- 018-0943-001 - Cable Assembly ID Long
- 018-0944-001 - Cable Assembly ID Short
- 015-0366-001 - Harness Assembly DC Internal