# Cbus 简介

Cbus 是 Honeywell 专有的现场总线，它用于 Honeywell 的 Excel 5000 系统中，实现了 Excel5000 系列控制器与现场设备，中央监控软件（SymmetrE，EBI）的数据交换。

一条 Cbus 总线可集成多达 29 个 Excel5000 控制器，控制器下面可以连接一些的现场设备的扩展，如：输入输出模块，Excel 10 控制器等。

Cbus 总线传输速率可从 9.6Kb 至 76.8Kb，Cbus 采用菊花链（daisy-chain）的总线结构，最大距离可达 1200m。C-bus 的总线长度与通讯速率和线材有关，一般来说，通讯速率的增加，最大总线长度减小，采用屏蔽线，最大总线长度减小。通讯速率为 76.8K 时，采用以下推荐的各种线材，最大总线长度为 1200m。

推荐的 Cbus 通讯线：

| Cable type | Description | Recommended for |
|---|---|---|
| J-Y-(ST)Y<br>2 x 2 x 0.8 | shielded,<br>twisted pair | Europe<br>Inside cabinet |
| A-Y-(ST)Y<br>2 x 2 x 0.8 | shielded,<br>twisted pair | Europe<br>Outside cabinet |
| AK 3702 | unshielded,<br>twisted pair | US<br>not approved for Europe |
| AK 3740A | shielded | US (low-cost)<br>not approved for Europe |
| Belden 9842 | twisted pair | Europe<br>US also possible |
| Belden 9841 | shielded | US |
| AK 3702 | unshielded,<br>twisted pair | US<br>not approved for Europe |
| AK 3740A | shielded | US (low-cost)<br>not approved for Europe |

C-bus 总线终端电阻

Excel5000 系统控制器上都自带有终端电阻，只需根据控制器的位置将拨码置于相应的位置即可。以下为 Excel 5000 系列常用控制终端电阻设置。

**Excel 800控制器：**

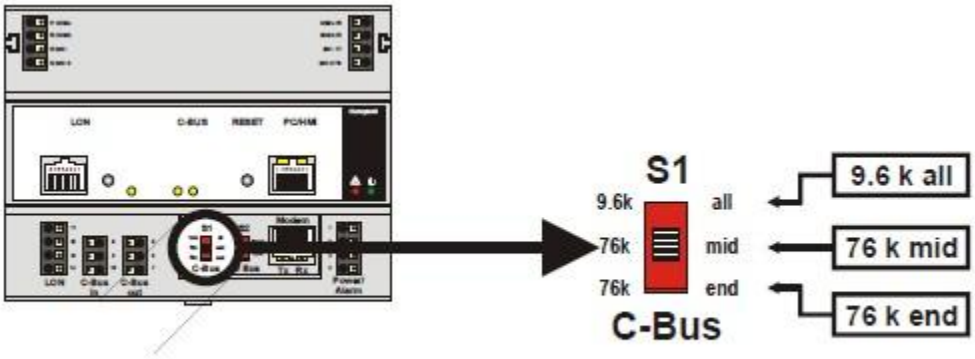
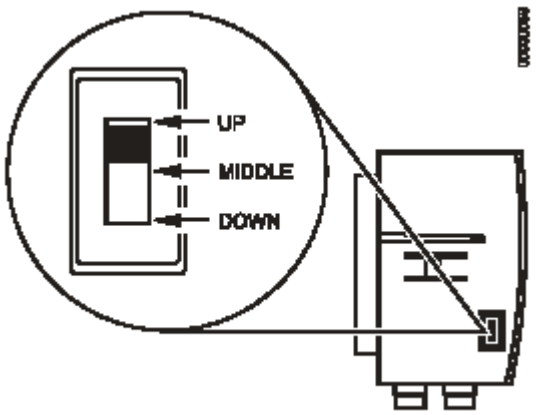



**Fig. 31. C-Bus Termination Switch**

**Table 9. XCL8010A C-Bus termination switch settings**

| switch setting | baud rate |
|---|---|
| 9.6k all | up to 9600 baud (default setting) |
| 76k mid | up to 76800 baud without bus termination |
| 76k end | up to 76800 baud with bus termination |

Excel 50 & Excel Smart 500 控制器（在通讯模块上）：




| Switch Setting | Baud Rate |
|---|---|
| Up | Up to 9.6Kbaud |
| Middle | Up to 76.8Kbaud (middle of bus) |
| Down | Up to 76.8Kbaud (beginning or end of bus) |

Honeywell

# C-Bus

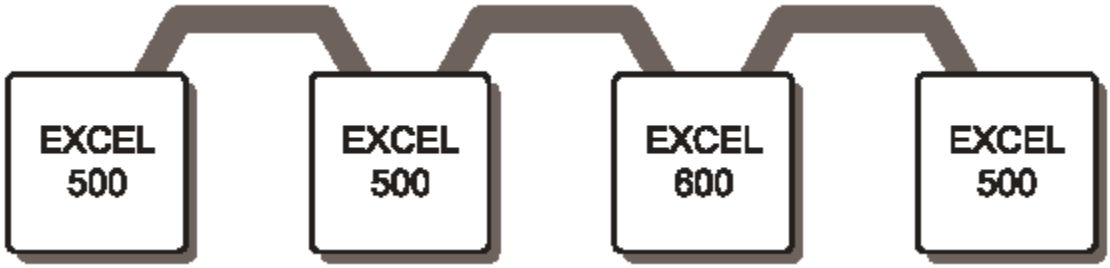
Up to 30 Excel controllers can be connected to one another via a System Bus (C-Bus). Other C-Bus compatible components can be substituted for any of the 30 Excel controllers. Examples of C-Bus compatible components are XM100 modem device, the Excel Zone Manager, and Excel Building Supervisors. The C-Bus allows controllers and devices to exchange data such as measured values, alarms log, and trends. This means that values from one controller or device can be sent to the entire system. Besides allowing communication between controllers and devices, the C-Bus also enables the entire system to be connected to PC centrals. When a controller does not have a modem directly connected, the C-Bus also allows controllers to communicate with other controllers that do have a modem connected, so that data can be transmitted via the public telephone network.

The C-Bus supports multi-master communication using the token passing procedure. A bus master is a controller governing communication between bus devices. The master asks for data and then distributes the data on the bus. Controllers transmit data only when asked for it by the master or when they assume the function of the master. Multi-master communication means that all controllers in the system can function as the master, so the right to request and transmit data is not permanently assigned to a specific controller. This has the advantage that a part of the system can still continue working even if one of the controllers is defective. The flow of data between devices can be structured hierarchically as part of the software in the user program. Structuring data exchange means defining what information can be exchanged between which bus devices. Communication is still carried out on the multi-master principle, but bus access time is reduced by concentrating specific data in specific controllers.

The C-Bus transmits data between the EXCEL 5000® System controllers, devices, and building supervisors at 9.6 Kbaud up to 76.8 Kbaud. The maximum C-Bus network length is 1,200 m (4000 ft) or 4,800 m (15,700 ft) using the XD507 or XD509 repeaters. There are a maximum number of 30 controllers or devices per C-Bus and the bus must be an open loop or daisy chain topology. NO T-TAPS, STUBS, STARS, SPURS of any length are allowed in Bus wiring. Always use point-to-point, daisy chain wiring, including inside the cabinets. There are regional differences as to whether shielded or unshielded cable must/can be used. See Excel 500/600 Installation Instructions 95-7524(EN1R-1047GE51) for wiring details.

The maximum C-Bus length is limited by wire type and baud rate. In general, the maximum length decreases with the use of shielded (or higher capacitance) wire and with increased C-Bus transmission speed. A maximum baud rate of 76,800 baud allows the C-Bus length to be up to 4000 ft (1200m) with all approved wire types. Use of untested wire types is not recommended.

System performance (C-Bus throughput) does not improve measurably with C-Bus baud rates above 76,800 and C-Bus length is severely limited. Therefore limit the baud rate to 76,800 baud unless required by job specification.




Recommended C-Bus Cable Types:

| Cable type | Description | Recommended for |
|---|---|---|
| J-Y-(ST)Y 2 x 2 x 0.8 | shielded, twisted pair | Europe<br>Inside cabinet |
| A-Y-(ST)Y 2 x 2 x 0.8 | shielded, twisted pair | Europe<br>Outside cabinet |
| AK 3702 | unshielded, twisted pair | US<br>not approved for Europe |
| AK 3740A | shielded | US (low-cost)<br>not approved for Europe |
| Belden 9842 | twisted pair | Europe<br>US also possible |
| Belden 9841 | shielded | US |
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For communication with more than 9600 baud it is required to enable the termination of the first and the last device on the C-bus (see the following

sections). Upon startup, the controllers with termination must be switched ON prior to the controllers in the middle of the C-bus. The C-bus might not work if the controllers with termination are switched OFF.

## C-Bus Terminations

Observe the following compatibility guidelines for C-Bus termination and biasing resistors:

1. If a C-Bus has 15 or less XD505/XD505A Submodules and/or repeaters, always terminate the bus at both ends. The termination can be accomplished by connecting the biasing network in the CPU to the bus as follows:

| Device | Connection |
|---|---|
| XC5010/XC6010 (Excel 500/600 Controller) | Terminal 13 to 16 and Terminal 14 to 17 |
| Excel 80B/100 B Controller and XM100A Modem Device | Terminal 31 to 34 and Terminal 32 to 35 |

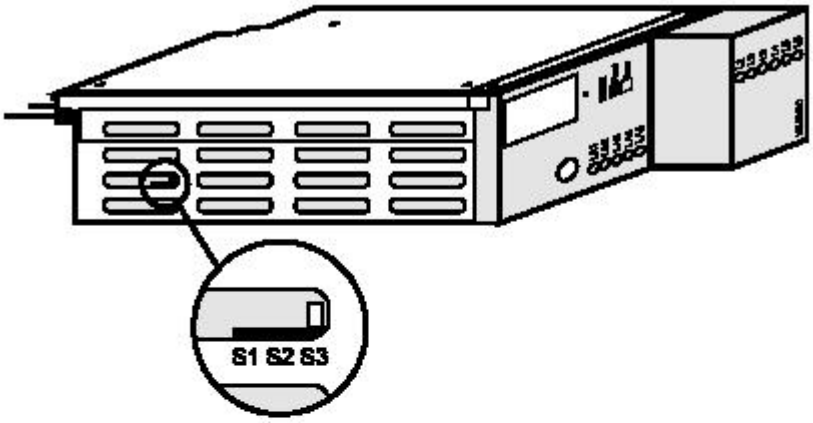
2. If a C-Bus has 16 or more XD505/XD505A Submodules and/or repeaters, terminate/bias one end only, preferably at the end device that is farthest from its adjacent device.

3. When using XD508 Submodules on the bus, biasing/termination is required at both ends and can be accomplished with the submodule DIP switch turned ON at the end devices.

4. Excel High Speed Repeater provides an on-board capability for switching in biasing/termination network at each port as needed. If it is an end device, a Repeater can be used to bias/terminate the bus as necessary in accordance with other rules in this section. The Repeater itself represents one unit load on the bus.

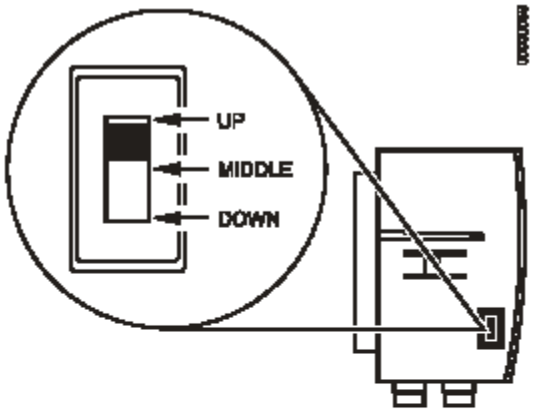
5. NEVER LEAVE THE BUS COMPLETELY UNTERMINATED.

Excel 500C controllers:




| Switch setting | Baud rate | Notes: |
|---|---|---|
| S1 | up to 76800 baud with bus termination | same functionality as XD508A, up to 76800 baud |
| S2 | up to 76800 baud without bus termination | same functionality as XD508A, up to 76800 baud |
| S3 | up to 9600 baud | same functionality as XD505A - **Default setting** |

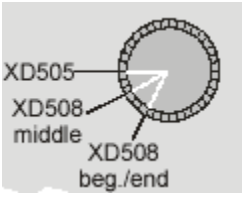
Excel 50 & Excel Smart 500 (located in Application Module):




| DIP switch setting | Communication speed | Controller location | Com-patibility |
|---|---|---|---|
| up | max. 9.6 Kbaud | - | XD505A, XL20XD |
| middle | max. 76.8 Kbaud | middle of bus | XD508, XL20XD508 |
| down | max. 76.8 Kbaud | beginning or end of bus | XD508, XL20XD508 |

Excel 100C:

The back of the Excel 100C housing is equipped with a rotary switch for the C-Bus to set the bus termination appropriate for the communication speed (see below).




| Switch setting | Communication speed | Controller location | Compatibility |
|---|---|---|---|
| up | max. 9.6 Kbaud | - | XD505A, XL20XD |
| middle | max. 76.8 Kbaud | middle of C-Bus | XD508, XL20XD508 |
| down | max. 76.8 Kbaud | beginning or end of C-Bus | XD508, XL20XD508 |

Excel 600 & Excel 100B/500B (earlier version Excel controllers):

Termination is applied by a jumper on the installed XD508 communication submodule. The XD508 submodule is equipped with a DIP switch which activates (ON position) deactivates (OFF position) a terminating resistor. Depending on where the controller is located on the bus the DIP switch settings must be as follows:

| Controller location | DIP switch setting |
|---|---|
| beginning or end of bus | ON |
| middle of bus | OFF |