

Home Automation SDK™



Description

The Home Automation SDK™ provides Microsoft Windows, IBM OS/2, and MS/PC-DOS developers the essential hardware and software development tools needed to construct X-10 compatible home automation systems.

Background

The X-10 system was first established in the late 1970s as a simple, AC power-line-based, remote control system. Commands are transmitted over the AC power lines already installed in virtually all homes throughout the U.S.A. and other countries thereby eliminating the need to install extra wires and cables.

To use the X-10 system, the user sets a house code (A-P) and a unit number (1-16) on a control module and plugs the module into an AC wall outlet. The user then plugs a lamp or appliance into the module. To control the module, a remote control console is set to the same house code, then buttons are pressed to select the particular module and to issue it commands. The X-10 command set is shown below:

House code	Decimal	Hexadecimal
A	6	06
B	7	07
C	4	04
D	5	05
E	8	08
F	9	09
G	10	0A
H	11	0B
I	14	0E
J	15	0F
K	12	0C
L	13	0D
M	0	00
N	1	01
O	2	02
P	3	03
Function code	Decimal	Hexadecimal

1		6		06
2		7		07
3		4		04
4		5		05
5		8		08
6		9		09
7		10		0A
8		11		0B
9		14		0E
10		15		0F
11	12		0C	
12		13		0D
13		0		00
14		1		01
15		2		02
16		3		03
All Units Off		16		10
All Lights On		24		18
On		20		14
Off		28		1C
Dim		18		12
Bright		26		1A
All Lights Off		22		16
Extended Code		30		1E
Hail Request		17		11
Hail Acknowledge		25		19
Preset Dim Low	21		15	
Preset Dim High		29		1D
Extended Data		19		13
Status=On		27		1B
Status=Off		23		17
Status Request		31		1F

The X-10 system has been expanded since it was first introduced. In addition to modules, there are also wall switches, switched outlets, chimes, relays, motion detectors, security systems, and other devices available that are X-10 compatible. A list of known X-10 product suppliers are provided at the end of this document.

A natural extension to the X-10 system is to allow a computer to send and receive X-10 commands through the power line. Computers generally are not designed to be connected to the power line (beyond their simple power supply), therefore great care must be taken. The TW523 computer interface module (included in the Home Automation SDK™ package) provides a safe, UL-approved, optoisolated connection to the power line allowing a computer to send, and receive X-10 commands.

The main drawback of the TW523 is the code complexity needed to drive the module. The module provide a very basic interface, requiring the host microprocessor to handle all of the complex timing, encoding, and decoding. In order to handle the demanding timing requirements of the X-10 interface, assembly language routines are a virtual necessity.

The Home Automation SDK™ includes a TW523 Two-Way Power Line Interface module and a DBTX10A PC Controller Card. The DBTX10A PC Controller Card has been designed to remove the burden of complex programming from the system designer. The DBTX10A uses a simple parallel port interface

that can be accessed from virtually any programming language including interpreted BASIC. It takes care of all the complex timing involved in sending and receiving commands to and from the power line. It also notifies you when AC power has been lost in battery backed (UPS) systems. Figure 1.0 below illustrates a typical X-10 based home automation system based on the DB Technologies Home Automation SDK™.

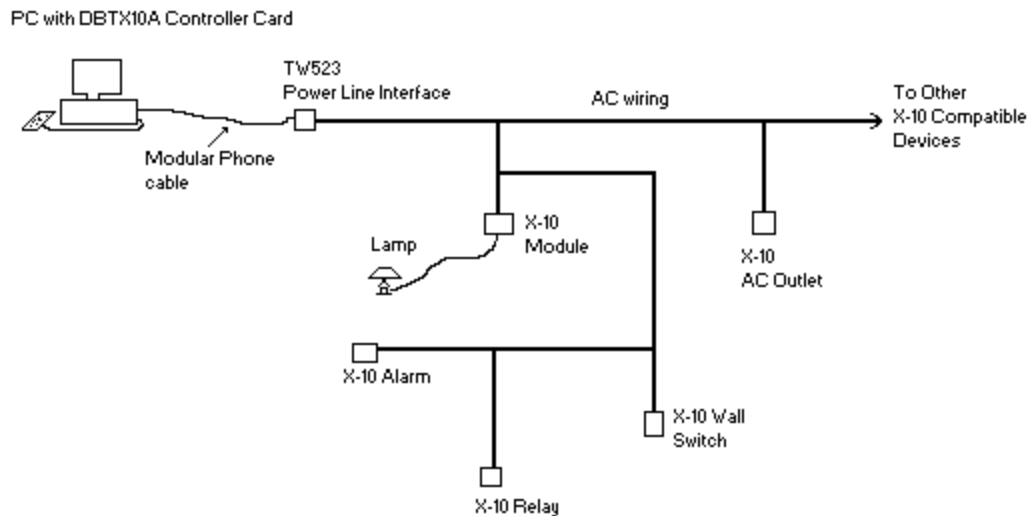


Figure 1.0. DB Technologies Home Automation System.

Every home automation system designed around the Home Automation SDK™ will require two hardware components to be added to the control PC:

- 1 - DBTX10A (8-bit) Controller Card.
- 1 - TW523 2-Way Power Line Interface.

Each of these components is available to designers from DB Technologies. Designers may purchase the TW523 module from other vendors if they desire, however, the DBTX10A controller card is available only through DB Technologies. The software tools provided in the Home Automation SDK™ (the **Home Automation Software Pack**) are provided on a royalty-free basis. Therefore, after purchasing the Home Automation SDK™, there are no additional software investments required to design and distribute an unlimited number of home automation packages. You may distribute the VBX and DLLs (at no additional cost) to your customers. However, each customer site will require the above mentioned hardware to connect the customers PC to the X-10 network (AC wiring).

The complete **Home Automation SDK™** retails for \$225. The package includes:

- (1) DBTX10A (8-bit) controller card for IBM compatible PCs.
- (1) TW523 2-way power line interface.

(1) Home Automation Software Pack - includes:

C-Language static library of DBTX10A driver functions for MS/PC-DOS and Windows 3.X

Visual Basic Custom Control X10.VBX for Visual Basic, Visual C++, and other VBX supported environments.

Dynamic Link Library of DBTX10A driver functions for OS/2 2.X (includes C-Language and REXX interface functions). Can be used in WATCOM's VX-REXX development environment.

(1) DBTX10A Software Developer's Guide

The following products can be purchased separately:

Home Automation Interface Package \$ 125.⁰⁰

Includes:

(1) DBTX10A (8-bit) Controller Card

(1) TW523 2-Way Power Line Interface

(1) 6-foot modular interconnect cable.

Home Automation Software Pack \$ 75.⁰⁰

Includes:

C-Language static library of DBTX10A driver functions for MS/PC-DOS and Windows 3.X

Visual Basic Custom Control (X10.VBX) for use with Visual Basic, Visual C++, and other VBX supported environments.

Dynamic Link Library of DBTX10A driver functions for OS/2 2.X (includes C-Language and REXX interface functions). Can be used in WATCOM's VX-REXX development environment.

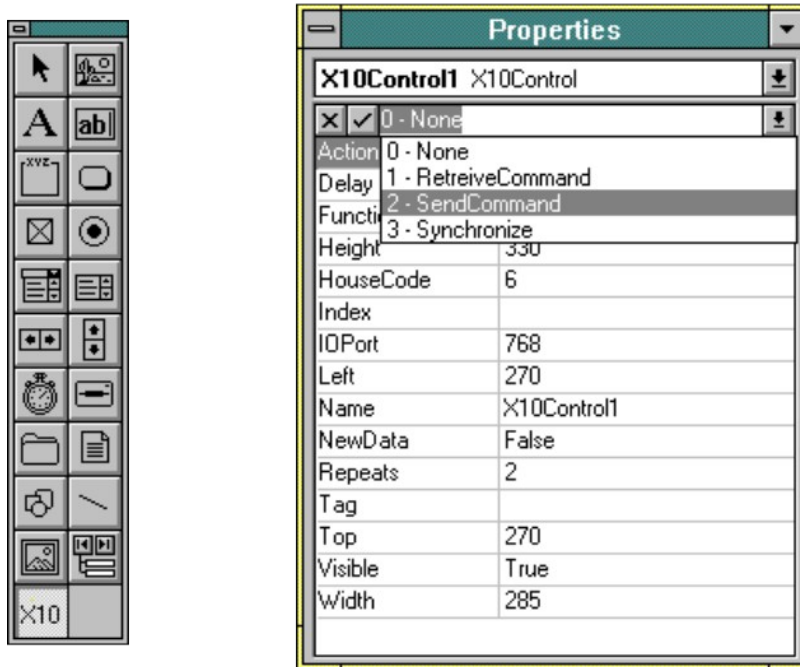
DBTX10A Software Developer's Guide \$ 25.⁰⁰

Guide provides complete information on how to write DBTX10A controller card interface software. This guide is the official reference guide for function library and device driver writers.

DBTX10A (8-bit) Controller Card \$ 99.⁹⁵

TW523 2-Way Power Line Interface \$ 32.⁹⁵

Home Automation SDK™ X10 Custom Control (VBX)



The Home Automation SDK™ X10 Custom Control (VBX) shown above is a special interface to the DBTX10A controller card that provides programmer's with a very simple easy-to-use interactive tool for the Microsoft Visual Basic, Microsoft Visual C++, and the Borland C++ 4.0 development environments.

A Dynamic Link Library (X10.DLL) is provided for Microsoft Windows developers who desire or need to use a DLL rather than a VBX. OS/2 developers are provided with a Dynamic Link Library (X10OS2.DLL) as well as a static library of DBTX10A driver functions.

Finally a static library of X-10 interface functions (C-language) are provided for MS/PC-DOS developers. For developers who are using a different operating the systems the DBTX10A Software Developer's Guide is provided illustrating how to write your own X-10 drivers.

The Home Automation SDK™ includes several example programs complete with source code demonstrating how simple it is to write home automation application programs. A screen capture of one of the example programs is shown below:

Sample Application created using the X10 Custom Control (VBX)

Every customer who purchases the Home Automation SDK™ is entitled to free Technical Support by phone and via EMail.

A demonstration copy of the DBTX10.VBX is available CompuServe in the MSBASIC and MSLANG forums (Browse on KEYWORD DBTECHNOLOGIES).

To request additional product information please contact:

DB Technologies
2420 Briar Oak Circle
Sarasota, FL. 34232
(813) 378-3760

X-10 Compatible Product Suppliers

The systems listed below (in alphabetical order) use **X-10 POWERHOUSE™** modules developed, manufactured and supplied by X-10, and use controllers which transmit signals compatible with the X-10 standard. The systems marked with an * use modules and controllers developed, manufactured and supplied by X-10.

Advanced Control Technologies, Powerline Control Components	(317) 248-2640
AES, Pool & Spa Control	(904) 454-1630
American Products, Pool Control	(805) 523-2400
Amway, Home Control System / Amgard II™	(616) 676-6000
Apex, Security Alarm	(919) 876-0010
Aquadyne, Pool Control System	(213) 722-1755
Aquatherm, Series 3000 Spa System	(805) 388-1094
Baran-Harper Group, software for PL513	(416) 294-6473
Blue Earth Research, BEaR-1FB Programmable Controller	(507) 387-4001

C & K Systems, Big Switch™ P.I.R. Light Control	(408) 434-1149
Capricorn Wireless Security System	(704) 428-3451
CB Enterprises, Billiard Control Panel	(800) 628-7339
Chardonnay, Pool Control System	(818) 787-7779
CompuAbility, EZRA (E. C. S.)	(800) 433-8872
Covox, Inc., Voice Master™	(503) 342-1271
Crimeguard, Apex 5	(919) 362-4200
Cyberlynx, Smarthome™ System	(303) 444-7733
DB Technologies, Home Automation SDK™ (development tools)	(813) 378-3760
DEK Research Co., Multi-user software for the CP290 (uses THEOS O.S.)	(719) 635-3732
Dolphin, Billiard Management Software	(714) 240-6297
Dynamark, Security System	(301) 797-2124
Enerlogic, System 1400	(603) 880-4000
G.E. Marshall, Tel-A-Control (telephone control system)	(416) 240-1770
G.E., Homeminder™*	-
Gencor Software for the PL513	(519) 542-8863
Group Three Technologies Inc, SAMANTHA™ H.A. System	(805) 582-4410
Heath/Zenith, Reflex™ Home Controls	(616) 982-5642
Home Automation Inc., Model 1530	(504) 833-7256
Hydrus, PoolMinder™ System	(214) 350-8766
Hypertek, Homebrain™	(201) 534-9700
Intelligent Devices, Inc., Sophi Home Control System	(504) 734-7069
ITI, Caretaker™ System	(612) 777-2690
JDS, Telecommand System 100	(619) 487-8787
KY Enterprises, (Env. Controls for the disabled).	(213) 433-5244
Leviton, Decora™ Electronic Controls *	(718) 631-6555
L Phant™ Home Automation System	(813) 593-1590
Magic Mansions, System 2000	(312) 364-5257
Mastervoice, Butler in a Box™ (voice control)	(213) 594-6581
Medical Equipment Distributors, (Env. Controls for the disabled).	(806) 793-8421
Micromint Inc., Home Run™ System	(203) 871-6170
MRL, Security System	(703) 669-0195
Murray & Sons Co.Inc., Billiard Control Panel	(213) 323-1752
National Energy Consultants, Multi-Zone Control Panel	(319) 364-8805
NuTone, Remote Intercom Systems	(800) 543-8687
Nynex, PhoneWatch Security System	(914) 644-3797
Pal-Tech, Chicken-House Control	(800) 328-8842
Prentke Romich Co., (Env Controls for the disabled)	(216) 262-1984
Radio Shack, plug 'n power™ System *	(817) 390-3232
Radio Shack, plug 'n power™ Homeminder™ *	(817) 390-3232
Rollins Protective Services, Security System	(404) 888-2940
Safko International, (voice control)	(602) 479-1987
Schlage, Keepsafer™ Security System	(415) 467-1100
Sears, Home Control System *	(312) 875-2500
Shasta, Pool Control Systems	(602) 258-8981
Silent Knight Security Systems	(612) 493-6400
Solus Systems Inc., H. A. Panel	(503) 635-3966
Sonitrol, Security System	(407) 859-3350
Stanley Home Automation, LightMaker™ Garage Door Opener	(313) 344-0070
Stanley Home Automation, LightMaker™ Home Controls *	(313) 344-0070
Ultratec, Super Signal System™ (for the hearing impaired)	(608) 273-0707
Unity Systems, Home Manager™	(415) 369-3233
Universal Electronics Inc., One-For-All™, Infrared Control System *	(800) 872-2682
Westec, 5000 Alarm Panel	(800) 877-3287
X-10 POWERHOUSE™ System, (formerly BSR System X-10) *	(201) 784-9700
X-10 (USA) Inc.	(201) 784-9700

(800) 526-0027