OMNI-BEAM PHOTOBUS™ OPBX2 Power Blocks
for use in APC Seriplex® programmable control systems

BANNER®
the photoelectric specialist

- APC Seriplex® networks offer unprecedented simplicity, economy, and noise-immunity in industrial control systems

- APC Seriplex networks are modular I/O systems capable of controlling up to 510 digital I/O points on a single network

- Using built-in Seriplex circuitry and assignable address codes, OMNI-BEAM PHOTOBUS™ power blocks establish logical relationships between the outputs of OMNI-BEAM™ sensors and other Seriplex-compatible devices on the network

  OPBX2 Series PHOTOBUS™ power blocks may be used with all OMNI-BEAM™ Standard and E Series sensor heads

APC hand-held progammer

OPBX2QD power block

OPBX2QD with OSBD sensor head attached
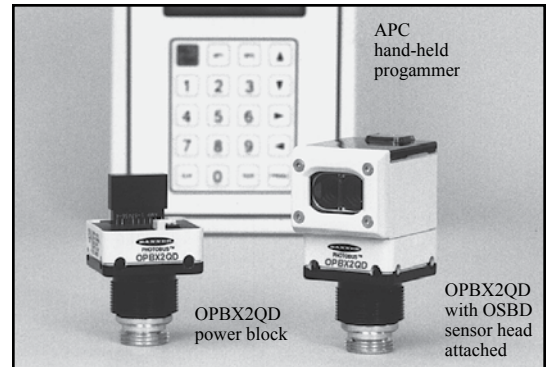
OMNI-BEAM PHOTOBUS™ OPBX2 Series Power Blocks are APC Seriplex® compatible and may be used on Seriplex networks with any OMNI-BEAM Standard (OS**B**__) or E Series (OS**E**_) Sensor Head.
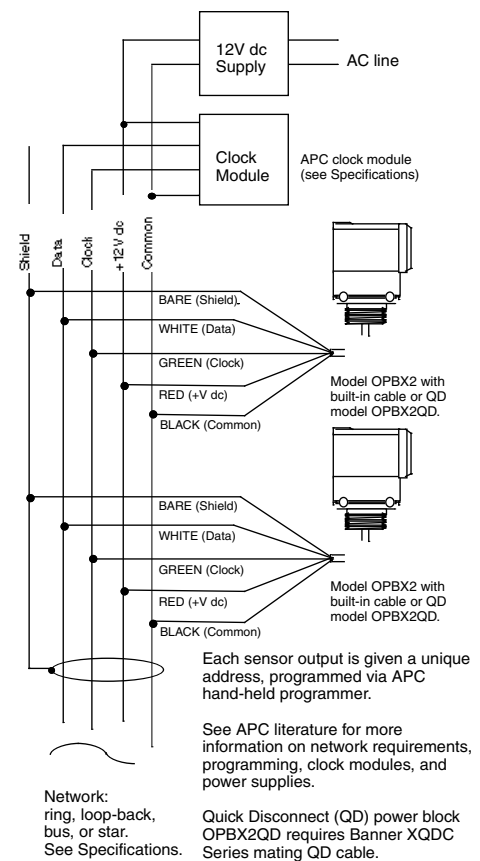
In use, OPBX2 Series Power Block-equipped OMNI-BEAM™ sensors, the devices to be controlled, a dc power supply, and a clock module all connect to a common network. One wire of the network supplies dc voltage of +9 to 12 volts, one wire is common (ground), another carries data, and another carries a synchronous, continuously-recycling clock signal. Each power block has a built-in EEPROM that is programmed, by the user, to recognize up to two different address codes.

Each power block output is given access to the data line of the network when that power block is addressed. At that time, the information on the addressed output becomes available on the data line for control or data collection purposes. The input(s) to any Seriplex module-equipped device(s) on the network that are to be controlled by a specific power block output are assigned the same address code as that power block output. The basic system, called a stand-alone system, requires no central processor. For applications that require a more complex, central control system, OPBX2 Series Power Blocks and APC Seriplex network technology support the use of a host processor. Consult APC for further information.

The capacity for two address codes per power block enables both sensor head outputs (load and alarm) of Standard OMNI-BEAM sensor heads to be used (and addressed separately). When E Series sensor heads are used, the normally open load output of the sensor head appears on both data outputs from the Seriplex power block. Power block programming is easily accomplished using the SPX Handheld Programmer (available from APC). Programming is discussed on p. 2.

All OMNI-BEAM sensor head LED indicators and sensor head programming DIP switches continue to function normally, as described in the sensor head product literature, when connected to a Seriplex® network.

Figure 1. OPBX2 Series Power Blocks in a Seriplex® stand-alone network

12V dc Supply — AC line

Clock Module — APC clock module (see Specifications)

Shield
Data
Clock
+12V dc
Common

BARE (Shield)
WHITE (Data)
GREEN (Clock)
RED (+V dc)
BLACK (Common)

Model OPBX2 with built-in cable or QD model OPBX2QD.

BARE (Shield)
WHITE (Data)
GREEN (Clock)
RED (+V dc)
BLACK (Common)

Model OPBX2 with built-in cable or QD model OPBX2QD.

Each sensor output is given a unique address, programmed via APC hand-held programmer.

See APC literature for more information on network requirements, programming, clock modules, and power supplies.

Network: ring, loop-back, bus, or star. See Specifications.

Quick Disconnect (QD) power block OPBX2QD requires Banner XQDC Series mating QD cable.

⚠ WARNING These photoelectric presence sensors do NOT include the self-checking redundant circuitry necessary to allow their use in personnel safety applications. A sensor failure or malfunction can result in either an energized or a de-energized sensor output condition.

Never use these products as sensing devices for personnel protection. Their use as safety devices may create an unsafe condition which could lead to serious injury or death.

Only MACHINE-GUARD and PERIMETER-GUARD Systems, and other systems so designated, are designed to meet OSHA and ANSI machine safety standards for point-of-operation guarding devices. No other Banner sensors or controls are designed to meet these standards, and they must NOT be used as sensing devices for personnel protection.

NOTE: This data sheet is concerned primarily with operating characteristics of Banner OMNI-BEAM OPBX2 Series Power Blocks. For information about the APC Seriplex® System itself, contact APC at:

106 Business Park Drive, Jackson, MS 39213
Tel (601) 956-2800   FAX (601) 956-9777

Connection to a stand-alone network

OMNI-BEAM OPBX2 Series PHOTOBUS™ Power Block Modules are connected in parallel with each other (and with the devices they are to control) on a Seriplex network. Possible network configurations include ring, loop-back, star, or bus. Power blocks are available with either attached cable or a built-in QD (Quick Disconnect) connector. QD models require Banner XQDC Series cable, sold separately.

Power block programming information

The programming information presented in this data sheet is in addition to the programming procedure details given in the Programming Seriplex™ I/O Modules section of the APC Seriplex Programmable Control System Instruction Manual provided with the APC hand-held programmer. Read and understand both the APC manual and the information below before attempting to program the OPBX2 Series Power Block.

OPBX2 Series Power Blocks are programmed, by the user, for three attributes (details below). The APC hand-held programmer connects to the programming port of the power block using a programming cable (model XPC1A, available from Banner, see Figure 2 for connection information). Programming is typically done at initial system setup, and may be done either before or after the power block is wired into the Seriplex network. Since EEPROMs retain their programmed information in spite of power failures, they need be reprogrammed only if the usage of the sensor within the network changes. **The three programmable attributes are:**

Address number: The load and alarm outputs from Standard OMNI-BEAM Sensor heads are separate and distinct, and are addressed separately as channel A (load) and channel B (alarm). If the alarm signal is not required, assign channel B to an unused address. When E Series Sensor Heads are used, the normally open load output from the sensor head appears simultaneously on both power block outputs (A and B). Addresses are decimal values in the range of 001 through 255, and need not be assigned in numerical order. (NOTE: Care should be taken when choosing addresses. The Seriplex® system will logically "OR" signals with the same address. See Seriplex® literature for more information.)

Power block output status: Bits 6 and 7 of the control byte (Figure 3) are used to configure channel B and channel A power block outputs (respectively). Setting these bits to "1" inverts the signal within the power block. It is recommended that these bits be set to "0". Signal inversions may instead be performed via a dip switch inside the sensor head.

Module mode: Bit 0 in the control byte (Figure 3) is used to select the power block's mode of operation. Set this bit to "0" if there is no host processor connected (stand-alone mode). If output data will be read from the data line as set by a host processor , set this bit to "1".

Bits 1 and 2 are test bits which are not used in normal operation, and must be set to "1".

Figure 2. Power block with jumper plug in operating position (left), and with jumper plug removed and programming cable attached (right); APC hand-held programmer in background.
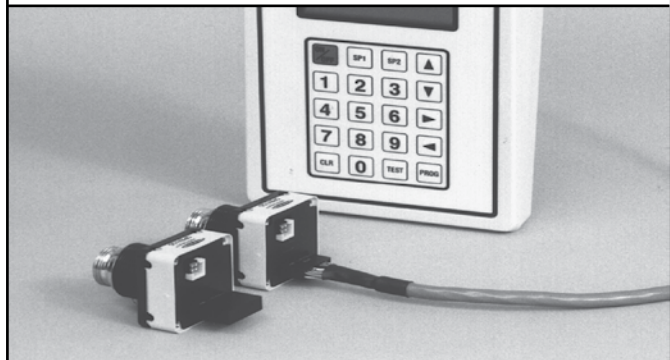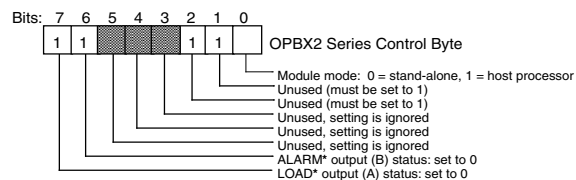

Figure 3. OPBX2 Series control byte

Bits: 7 6 5 4 3 2 1 0

| 1 | 1 | | | | 1 | 1 | OPBX2 Series Control Byte

Module mode: 0 = stand-alone, 1 = host processor
Unused (must be set to 1)
Unused (must be set to 1)
Unused, setting is ignored
Unused, setting is ignored
Unused, setting is ignored
ALARM* output (B) status: set to 0
LOAD* output (A) status: set to 0

*OMNI-BEAM Standard sensor heads. When E Series sensor heads are used, the normally open LOAD output from the sensor head appears simultaneously on both A and B power block outputs.

See discussion at left for more information.
Programming is done via the APC Hand-held Programmer.

Specifications, OPBX2 Series power blocks

Models: OPBX2 (attached 6-1/2 foot cable), or OPBX2QD (5-pin minifast™ QD; requires Banner XQDC12 Quick Disconnect cable).

Supply voltage: +9 to 12V dc; 80 mA per sensor at 12V dc (power block output conducting).

Clock requirements: Use APC SPX-CLK Series clock module, available from APC.
SPX-CLK10K (10 kilohertz)   SPX-CLK64K (64 kilohertz)
SPX-CLK32K (32 kilohertz)   SPX-CLK100K (100 kilohertz)
One clock module is required per stand-alone network.

Wiring information: Use only Seriplex-compatible cable.
Standard OPBX2 model has a 6-1/2 foot attached unterminated cable.
QD model OPBX2QD requires Banner XQDC12 mating QD cable. QD cable length is 12 feet; 5-pin minifast™ female sensor connector on one end with other end unterminated.

Unterminated sensor extension cable (XECS Series) is available.

For bus cable, use Banner XECT Series cable.

Banner PHOTOBUS™ BUS DEPOT™ junction boxes provide a convenient means of connecting PHOTOBUS™ sensors to a SERIPLEX® bus. Model BD6T1 (product data sheet 34146) enables parallel connection of up to six I/O devices on a continuing bus. Model BD2T2 enables parallel connection of two bus branches or two I/O devices on a continuing bus (see product data sheet 34437).

Programming cable: Model XPC1A, available from Banner. Jumper plug is model XPJ1, and is supplied with the power block.