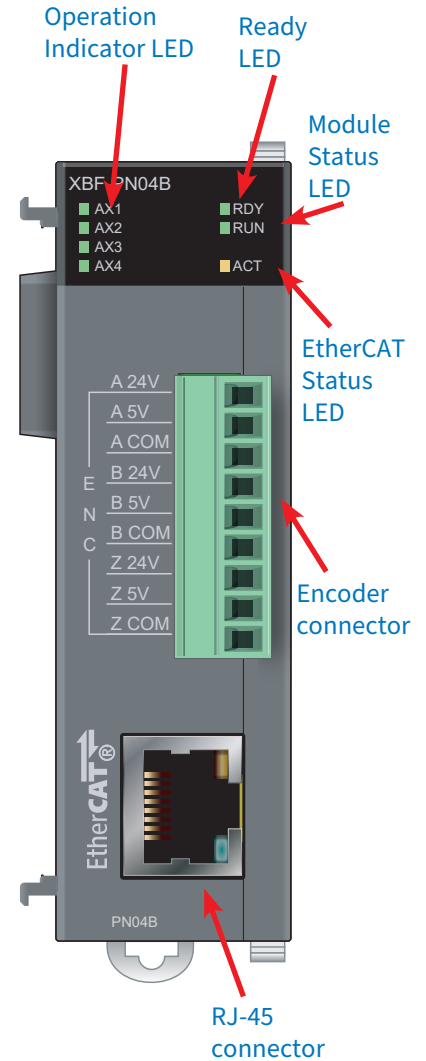


XBF-PN04B / XBF-PN08B EtherCAT® Multi-Axis Positioning Module



| Part Number | Price | Classification | Description | # of Axes | Drawing |
|---------------------------|----------|----------------|---|-----------|---------|
| XBF-PN04B | \$350.00 | Positioning | LS Electric XGB 4-axis positioning module, EtherCAT Master, 1 high-speed input point(s), sinking/line driver (differential), 1-channel, differential and single-ended encoder input(s), (1) Ethernet 100Base-TX (RJ45) port(s). For use with LS Electric XEM-DxxxHx PLCs. | 4 | PDF |
| XBF-PN08B | \$395.00 | | LS Electric XGB 8-axis positioning module, EtherCAT Master, 1 high-speed input point(s), sinking/line driver (differential), 1-channel, differential and single-ended encoder input(s), (1) Ethernet 100Base-TX (RJ45) port(s). For use with LS Electric XEM-DxxxHx PLCs. | 8 | PDF |

| General Specifications | | XBF-PN04B | XBF-PN08B | | |
|---------------------------------|-------------------------------|--|--------------------------|--------------------------|---|
| Number of Control Axis | | 4 | 8 | | |
| Interpolation Function | | 2-4 (8) axes linear interpolation, 2 axes circular interpolation, 3 axes helical interpolation | | | |
| Control Method | | Position control, Torque Control, Speed control, Speed/Position control, Position/Speed control, Position/Torque control, Feed control | | | |
| Control Unit | | Pulse, mm, inch, degree | | | |
| Positioning Data | | Can have up to 400 steps for each axis (1-400) available to set with XG-PM or program | | | |
| XG-PM | Connection | RS-232C port, EtherNet port, or USB. Connect through XEM CPU. | | | |
| | Setting Data | Common, Basic, Extended, Servo parameter, Operation data, Cam data, Command information | | | |
| | Monitor | Operation information, Trend, External input signal, Error information | | | |
| Backup | | Saves parameters and operation data in MRAM and flash ROM | | | |
| Positioning | Positioning Method | Absolute or Incremental | | | |
| | Position Address Range | Unit | Absolute | Incremental | Speed/Position, Position/Speed Switching Control |
| | | µm | -214748364.8-214748364.7 | -214748364.8-214748364.7 | -214748364.8-214748364.7 |
| | | Inch | -21474.83648-21474.83647 | -21474.83648-21474.83647 | -21474.83648-21474.83647 |
| | | Degree | -21474.83648-21474.83647 | -21474.83648-21474.83647 | -21474.83648-21474.83647 |
| Pulse | | -2147483648-2147483647 | -2147483648-2147483647 | -2147483648-2147483647 | |
| Speed Range | Unit | Range | | | |
| | mm | 0.01-20000000.00 (mm/min) | | | |
| | Inch | 0.001-2000000.00 (Inch/min) | | | |
| | Degree | 0.001-2000000.00 (degree/min) | | | |
| | Pulse | 1-20,000,000 (pulse/sec) | | | |
| | RPM | 0.1-100000.0 (RPM) | | | |
| Acc./Dec. Process | | Trapezoid-shaped, S-curve | | | |
| Manual Operation | | Jog operation, Manual Pulse Generator (MPG) operation, Inching operation | | | |
| Homing Method | | Refer to the method supported by the servo drive | | | |
| Speed Change Function | | Speed change (percent/absolute value) | | | |
| Torque Command Unit | | Rated torque % designation | | | |
| Absolute Position System | | Available (when using absolute encoder type servo motor) | | | |



NOTE: EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

XBF-PN0xB Multi-axis Positioning Module, continued


| General Specifications | | XBF-PN04B | XBF-PN08B |
|---------------------------------|----------------------|--|-----------|
| External Encoder Input | Channel | 1 channel | |
| | Maximum Input | 200kpps | |
| | Input Form | Line drive input (RS-422A IEC specification), open collector output type encoder | |
| | Input Type | CW/CCW, Pulse/Dir, Phase A/B | |
| | Connection Connector | 9-point connector | |
| External Command Signal | Input Point | 3-point (Input signal A,B,Z) | |
| | Input Specification | Same as input specification of external encoder (5V, 24V) | |
| | Connector | 9-point connector (input terminal of external encoder shared) | |
| Communication Period | | 1/2/3/4 ms | |
| Maximum Transmission Distance | | 100m | |
| Communication Cable | | Over CAT.5 STP (shielded twisted-pair) cable | |
| Error Indication | | Indicated by LED | |
| Communication Status Indication | | Indicated by LED | |
| Consumable Current | | 510mA | |
| Supported EtherCAT Devices | | Only EtherCAT servo and stepper drives that use CANopen over EtherCAT (CoE) | |
| Max Modules per XEM CPU | | Max of two (2) modules installed immediately adjacent to XEM CPU (slot 2 and 3) | |
| Weight | | 115g | |

Encoder Input Specifications

NOTE: Encoder inputs can also be used for external command signals.

| Specification | Open Collector | | Line Driver |
|----------------------------|----------------------|-------------------------|---|
| Input Voltage | 5VDC (4.5 V – 5.5 V) | 24VDC (19.2 V – 26.4 V) | In accordance with RS-422A Line Driver Level (5V level) |
| Input Current | 8mA–11mA | 8mA–11mA | |
| Min. On Guarantee Voltage | 4.1 V | 17.0 V | |
| Max. Off Guarantee Voltage | 1.7 V | 4.5 V | |
| Input Pulse | 1) Pulse width | | |
| | | | |
| Input Pulse | 2) Phase difference | | |
| | | | |

XBF-PN0xB Connector Pin Assignments

| XBF-PN0xB Pin Arrangement | | | | |
|---|---------|-------------|---------------------|------------------|
| Pin Arrangement | Pin No. | Description | Signal Name | Signal Direction |
|  <p>A 24V A 5V A COM B 24V B 5V B COM Z 24V Z 5V Z COM</p> | 1 | A 24V | Encoder A 24V input | Input |
| | 2 | A 5V | Encoder A 5V input | |
| | 3 | A COM | Encoder A input COM | |
| | 4 | B 24V | Encoder B 24V input | |
| | 5 | B 5V | Encoder B 5V input | |
| | 6 | B COM | Encoder B input COM | |
| | 7 | Z 24V | Encoder Z 24V input | |
| | 8 | Z 5V | Encoder Z 5V input | |
| | 9 | Z COM | Encoder Z input COM | |



NOTE: 5VDC encoders use the 5V terminals and 24VDC encoders use the 24V terminals. Compatible with 12V systems (see the User Manual for dropping resistor specifications).

XBF-PN0xB Variable Assignments

Direct Variables

XGB series EtherCAT modules are assigned 1 word of status information in the “U” memory area based on the slot number assignment. (%UX0.z.0 - %UX0.z.15, z=slot number). See the table below for Direct Variable assignments.

For Direct Variable nomenclature explanation, see [Direct Variable User Programming Memory](#).

Symbolic Variables

Symbolic variables for the motion module can be automatically created in XG5000 software by using the top MENU bar: Edit > Register Module Variable Comments.

Symbolic variables and direct variables for XBF-PN04B/08B are as follows (z refers to module slot number (2 or 3)).

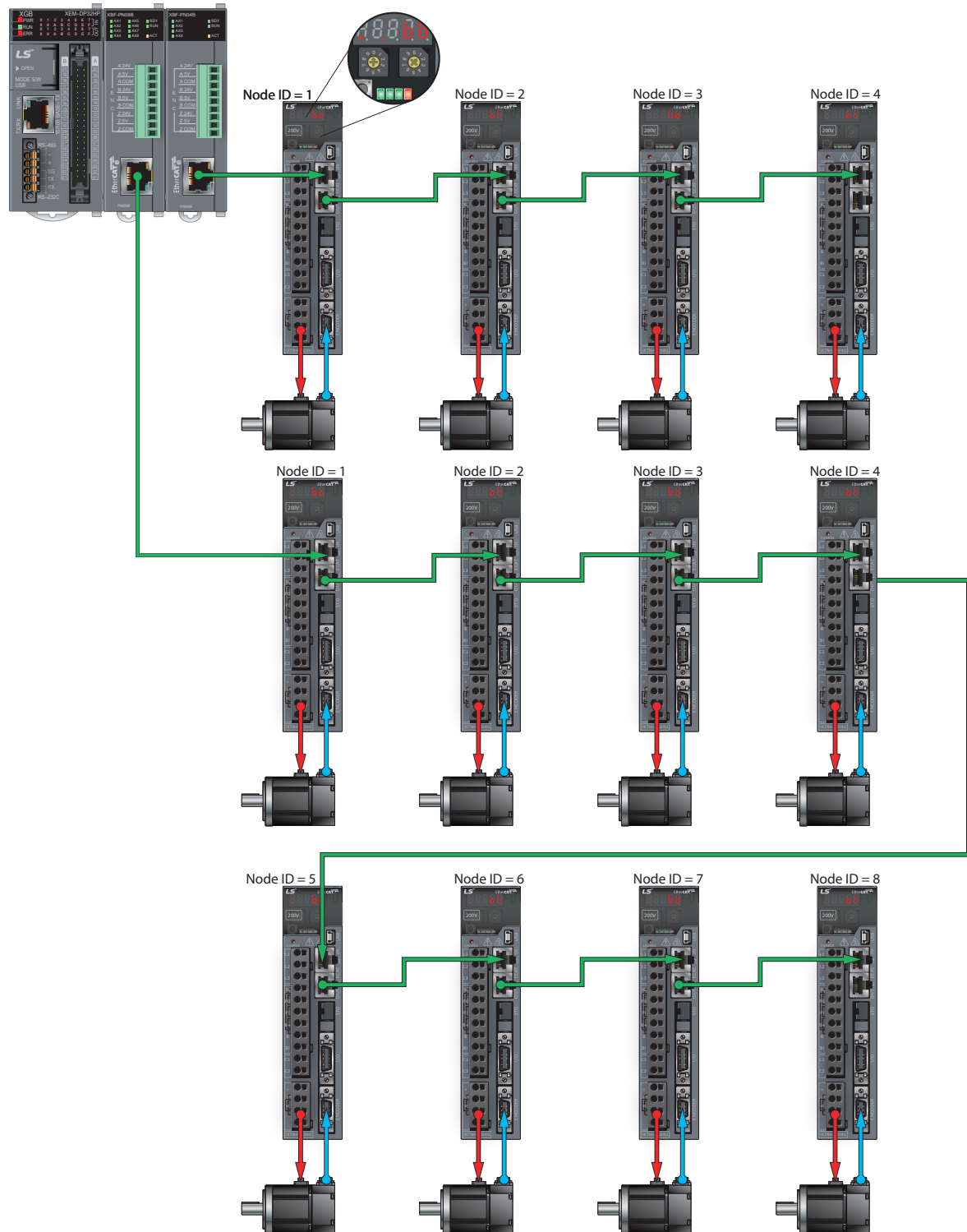
| Type | Scope | Variable (Symbolic) | Address (Direct Variable Alias) | Data Type | Comment |
|------|---------------|---------------------|---------------------------------|-------------|--|
| Tag | GobalVariable | _000z_A1_RDY | %UX0.z.0 | BOOL | Positioning Module: 1-Axis Ready |
| Tag | GobalVariable | _000z_A2_RDY | %UX0.z.1 | BOOL | Positioning Module: 2-Axis Ready |
| Tag | GobalVariable | _000z_A3_RDY | %UX0.z.2 | BOOL | Positioning Module: 3-Axis Ready |
| Tag | GobalVariable | _000z_A4_RDY | %UX0.z.3 | BOOL | Positioning Module: 4-Axis Ready |
| Tag | GobalVariable | _000z_A5_RDY | %UX0.z.4 | BOOL | Positioning Module: 5-Axis Ready |
| Tag | GobalVariable | _000z_A6_RDY | %UX0.z.5 | BOOL | Positioning Module: 6-Axis Ready |
| Tag | GobalVariable | _000z_A7_RDY | %UX0.z.6 | BOOL | Positioning Module: 7-Axis Ready |
| Tag | GobalVariable | _000z_A8_RDY | %UX0.z.7 | BOOL | Positioning Module: 8-Axis Ready |
| Tag | GobalVariable | _000z_AX_RDY_AR | %UX0.z.0 | ARRAY[0..7] | Positioning Module: Each Axis Ready |
| Tag | GobalVariable | _000z_LINKUP_INF | %UX0.z.14 | BOOL | Positioning Module: Link up/down informatoin |
| Tag | GobalVariable | _000z_RDY | %UX0.z.15 | BOOL | Positioning Module: Ready Flag |

XBF-PN0xB EtherCAT Drive/Motor Setup Example

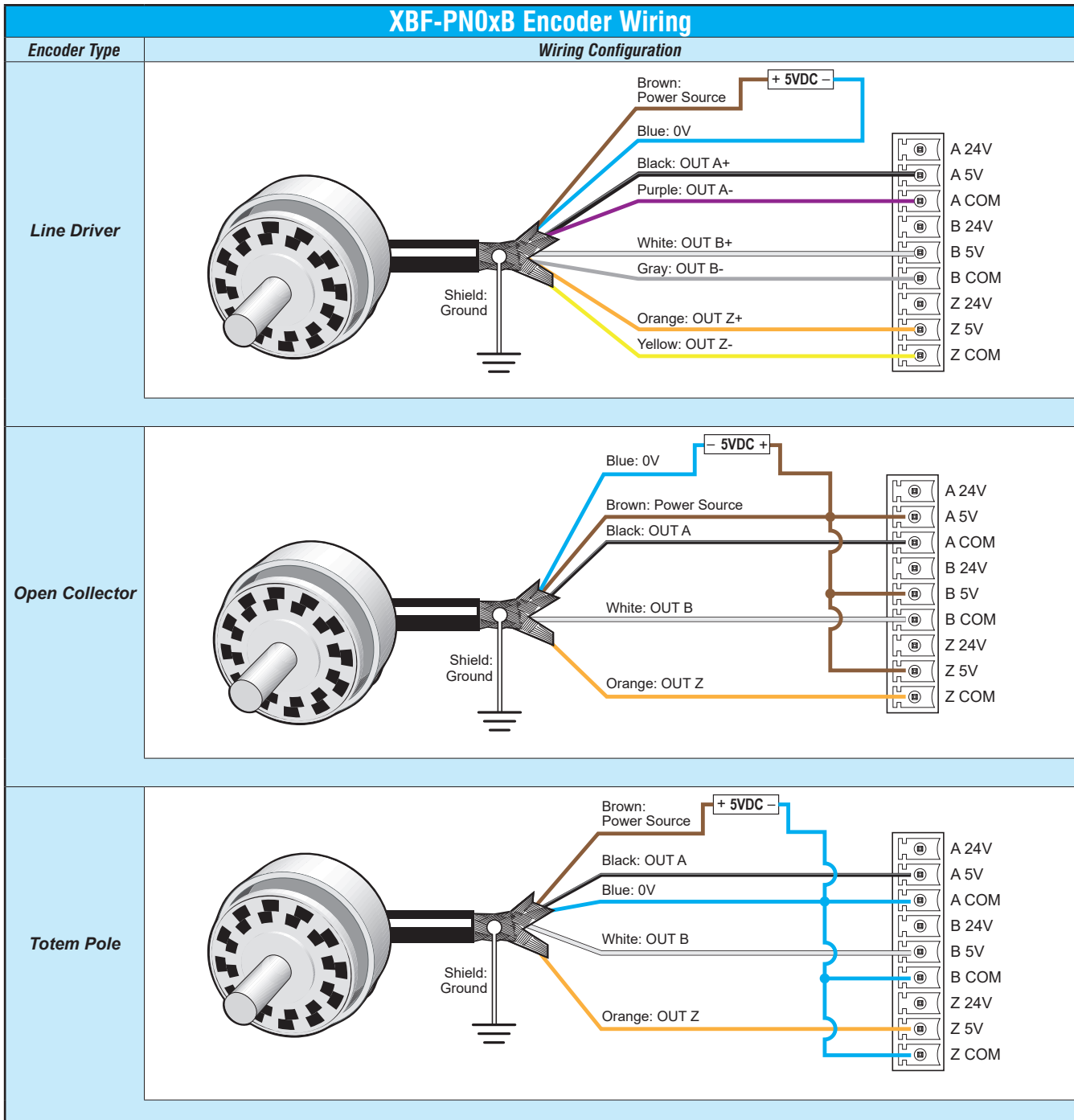
LS Electric iX7NH EtherCAT drives can be found [HERE](#).



NOTE: Each XBF-PN0xB module is a separate EtherCAT® network.



XBF-PN0xB Encoder Wiring Examples



For 12V encoders, use a 1k Ohm dropping resistor between each encoder signal (Out A, Out B, Out Z) and the corresponding 5V terminal above.
 For 24V encoder signals, wire each encoder signal (Out A, Out B, Out Z) to the A 24V, B 24V, and Z 24V inputs. No dropping resistor required.