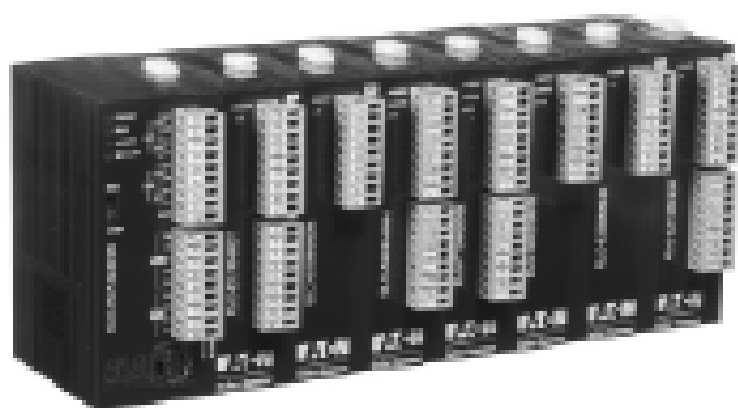


# ELC-COPBDP

Effective December 2010

## Users Manual





# Introduction

- ✓ This is an OPEN-TYPE device and therefore should be installed in an enclosure free of airborne dust, excessive humidity, shock and vibration. The enclosure should prevent non-maintenance staff from operating the device (e.g. key or specific tools are required to open the enclosure) to avoid potential equipment damage or personal injury. DO NOT touch any terminal when the power is switched on.
- ✓ Please read this manual carefully and follow the instructions to avoid damage to the product or personal injury.

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## 1 Introduction

Profibus is an international, open and vendor- independent communication protocol widely applied in manufacturing, production, processing and building automation and other automation control fields. The Profibus system contains 3 types of protocols depending on different application demands: Profibus-DP, Profibus-PA and Profibus-FMS.

The ELC-COPBDP provides the ability for an ELC processor to exchange data on a Profibus-DP network. The ELC-COPBDP acts as a Profibus-DP slave to a Profibus-DP master

### ■ Features

- Connects to any ELC processor
- Allows for user selectable data contents (selected in the ELC program)
- Cyclical data exchange process
- Support the SYNC and FREEZE for data synchronization between master and slaves
- Support Auto Baud rate detection
- Support 12MHz baud rate
- Cyclical data size is fixed to 4bytes input and 4bytes output
- Provides GSD file for configuration using 3<sup>rd</sup> party tools

## 2 Specification

### ■ Profibus-DP physical and transport layer

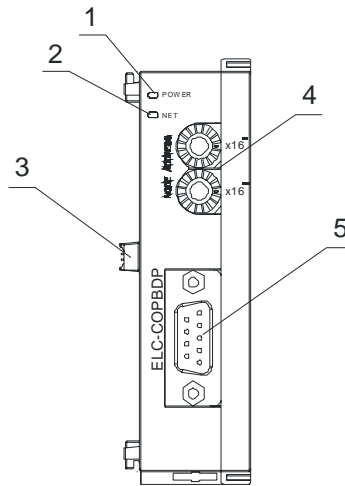
Interface	DB9 9 pin connector
Transfer method	High speed RS485
Transfer cable	2-wire twisted shielded cable
Electrical isolation	500VDC
Message types	DPV0, Cyclical data exchange process
Device ID	09B9 HEX
GSD file	EATN09B9.GSD
Model Name	ELC-COPBDP
Baud rates (Auto detected)	9.6kbps, 19.2kbps, 93.75kbps, 187.5kbps, 500kbps, 1.5M bps, 3M bps, 6M bps, 12M bps

### ■ Environmental specifications and agency certifications

Noise Immunity	ESD(IEC 61131-2, IEC 61000-4-2): 8KV Air Discharge EFT(IEC 61131-2, IEC 61000-4-4): Power Line: 2KV, Digital I/O: 1KV, Analog & Communication I/O: 1KV RS(IEC 61131-2, IEC 61000-4-3): 26MHz~1GHz, 10V/m
Operation/storage temperature	Operation: 0°C ~55°C (Temperature), 50~95% (Humidity), Pollution degree 2; Storage: -25°C ~70°C (Temperature), 5~95% (Humidity)

Vibration/Shock Immunity	Standard: IEC61131-2, IEC 68-2-6 (TEST Fc) IEC61131-2 & IEC 68-2-27 (TEST Ea)
Agency certification	UL508 UL1604, Class1,Div2    Operating temperature code: T5 European community EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC

### 3 Product Profile and Outline



1. Power LED

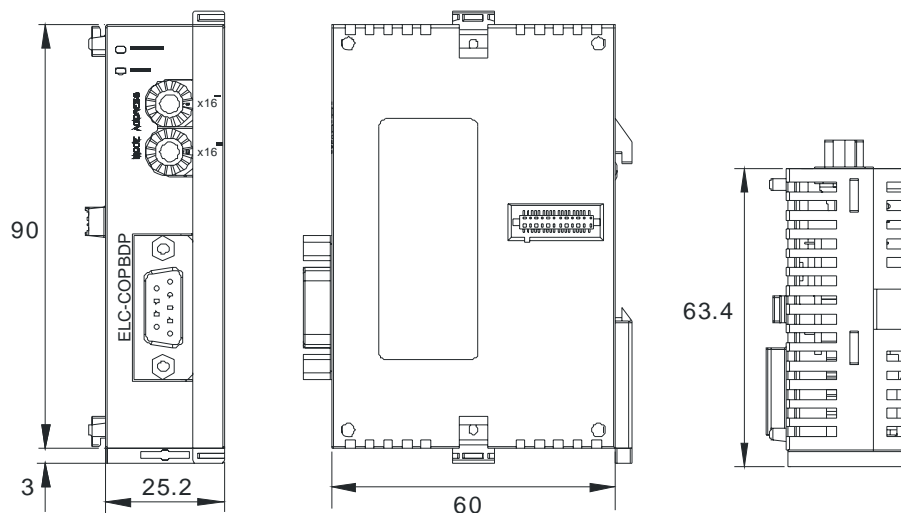
2. Net LED

3. Extension port

4. Address switch

5. Profibus connector

#### ■ Dimension

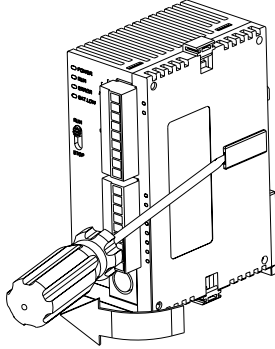


Unit: mm

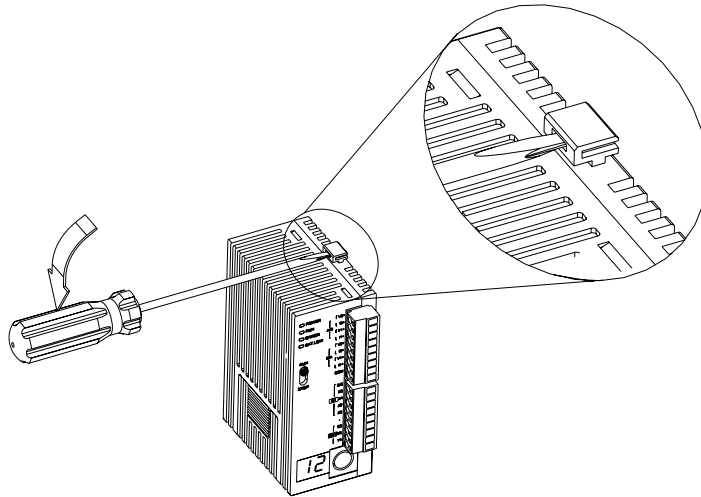
## 4 Installation and Wiring

### ■ Installing the ELC-COPBDP with the ELC controller

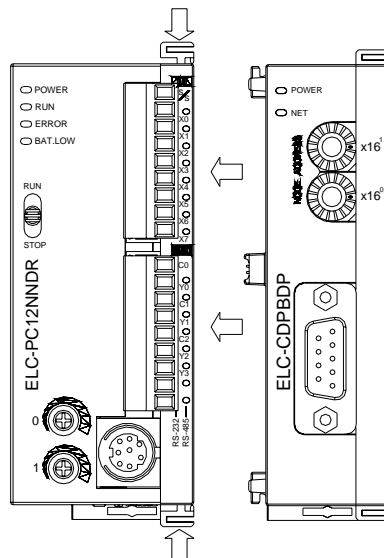
Open the extension cover with a screwdriver.



Use a screwdriver to lift and unfasten the extension clips.

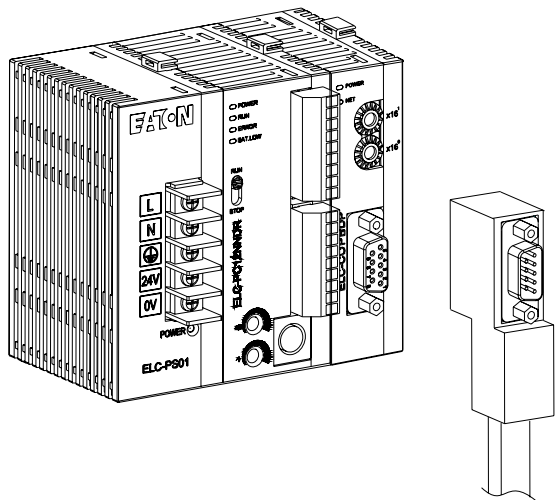


Connect the ELC-COPBDP to the extension port of the ELC controller and fasten the extension clips.



# ELC-COPBDP

Plug the PROFIBUS connector into the socket of the ELC-COPBDP, and tighten the screw to secure the connector.



■ Limitation of Cable length vs. Baudrate

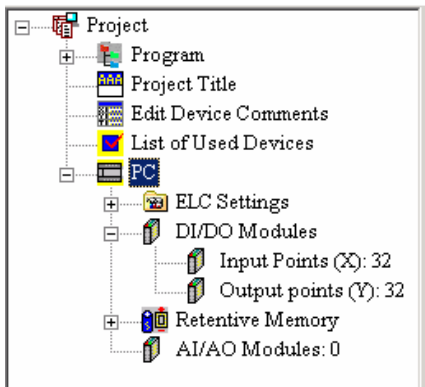
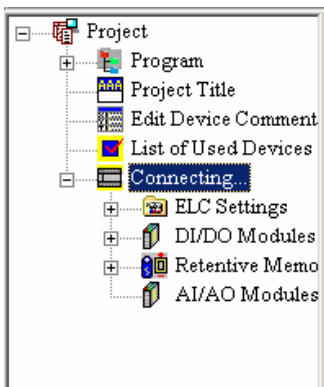
The Maximum cable length in a segment depends on the transmission speed. PROFIBUS-DP communicates at speeds from 9.6kbps to 12Mbps over distances from 100 to 1,200 meters.

Baud Rate (bps)	9.6k	19.2k	93.75k	187.5k	500k	1.5M	3M	6M	12M
Length (m)	1200	1200	1200	1000	400	200	100	100	100

This demonstrates checking the successful connection of the extension I/O using ELC software:

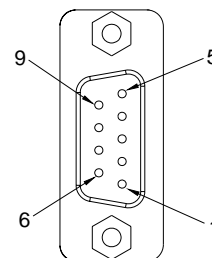
Connecting to the ELC controller...

Once the connection is complete, the software will indicate 32 input points and 32output point are present.



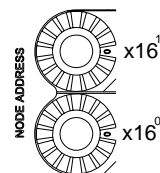
■ **DP Connector Assignment**

Pin	Designation	Content
1	--	NC
2	--	NC
3	RxD/TxD-P	Data receiving/sending P (B)
4	--	NC
5	DGND	Data reference potential (C)
6	VP	Positive voltage
7	--	NC
8	RxD/TxD-N	Data receiving/sending N (A)
9	--	NC



■ **MAC ID setting for the ELC-COPBDP module**

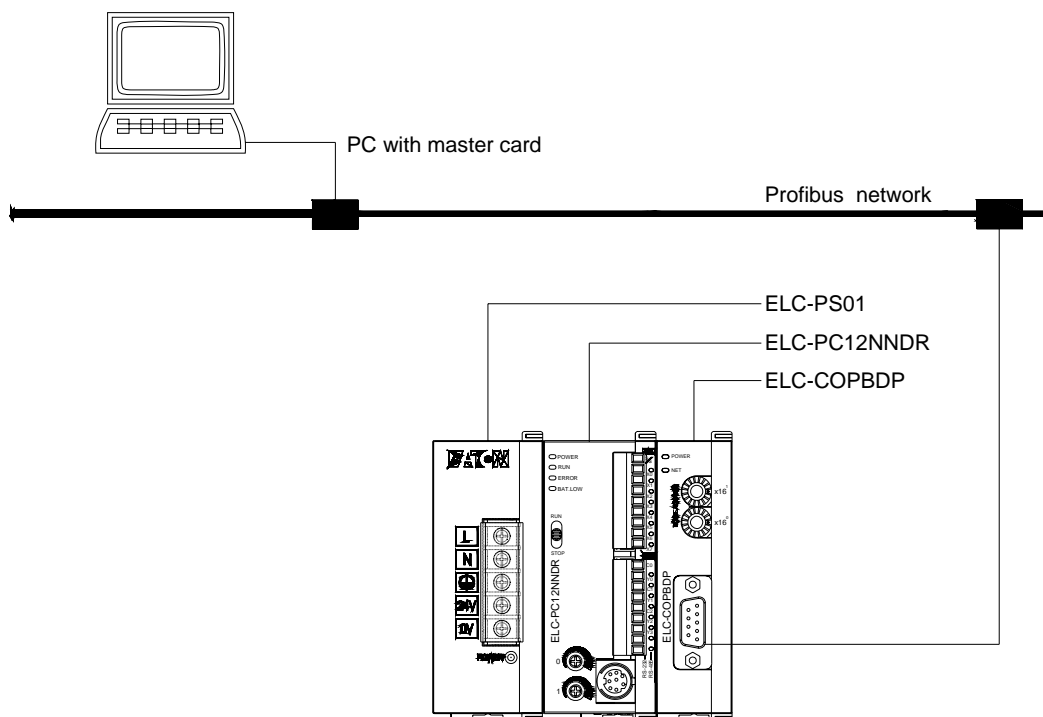
Address	Content
1 to 0x7D	Valid PROFIBUS Address.
0 or 0x7E to 0xFF	Invalid PROFIBUS Address. NET LED will rapidly blink RED when node address is at 0, 0x7E~ 0xFF.



## 5 Application Description

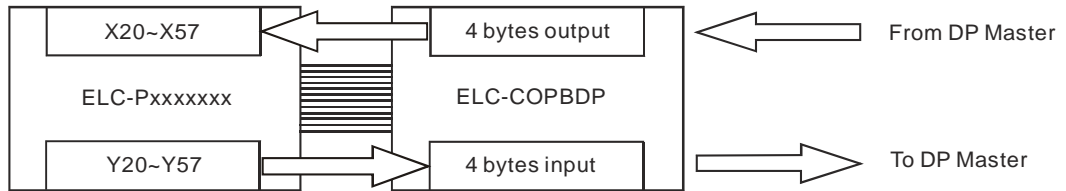
■ **Connecting the ELC-COPBDP to the Profibus-DP network**

The ELC-COPBDP connects as a slave node on a Profibus-DP network:



If you need more information on installing a Profibus-DP network, see “[Profibus Planning Guideline](#)” available from [Profibus.org](#).

### ■ Data mapping to the DP network:

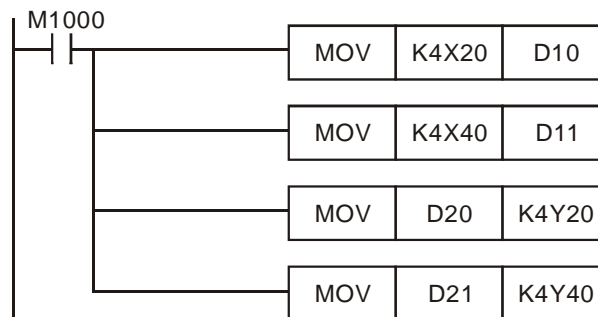


The ELC-COPBDP provides a fixed 4bytes of input data and 4bytes of output data that are exchanged with a Profibus master.

The 4bytes of input data are transmitted from the ELC-COPBDP module to the Profibus Master. This data is automatically taken from the output relays (Y) assigned to the extension unit. For example if the ELC-COPBDP is the first extension unit, the 4 bytes of data come from Y20-Y57 of the ELC controller..

The 4bytes output data are transmitted from the Profibus Master to the ELC-COPBDP module. This data is automatically placed in the input points (X) assigned to the extension unit. For example if the ELC-COPBDP is the first extension unit, the 4 bytes of output data is placed in X20-X57 of the ELC controller.

### ■ Example ladder program :



This program example copies the 4 bytes data from X20-X57 that are transmitted by the Profibus-DP master to D10 and D11 registers in the ELC controller. It also copies ELC register D20 and D21 to Y20-Y57. These 4 bytes data are sent to the Profibus-DP master.

**MEMO**