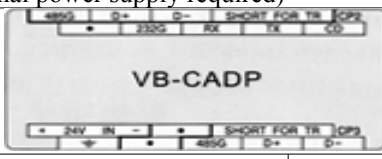# VB-CADP
Dual-Port Communication Expansion Module

This VB-CADP module is a multi-functional communication expansion module. It connects to the left side of VB and VH series or uses a particular cable to connect with M series, then the PLC main unit will has three communication ports.

★ Feature :

- CP2 and CP3 expansion module.
- CP2 provides isolated RS-232 or RS-485 communication interface. The communication distance of this RS-485 is up to 1000M.
- CP3 provides isolated RS-485 communication interface with the communication distance of this RS-485 is up to 1000M.
- CP2 is a multi-functional communication port which can be assigned for various communication applications, e.g. Computer Link, CPU Link, Parallel Link, Easy Link, MODBUS Communication, MODEM Communication and Non-Protocol Communication.

★ Specification :

Item\Port	CP1	CP2*		CP3
Communication Interface	RS-232C	RS-232C	RS-485	RS-485
Isolation Method	No Isolation	Photocoupler Isolation		
LED Signal	RX, TX	RX, TX		RX, TX
Max. Communication Distance	15M	15M	1000M	1000M
Communication Method	Semi-duplex			
Baud Rate	19200 bps	300/600/1200/2400/4800/9600/19200/38400 bps		19200 bps
Communication Protocol	**Computer Link** : M , VB and VH Series PLC communication protocol **Baud Rate** :19200bps **Data Length** :7 bit (ASCII) **Parity** :EVEN **Stop bit** :1 bit	**Computer Link** **Easy Link** **MODEM(RS-232)** } M , VB and VH Series PLC communication protocol **CPU Link(RS-485)** **Parallel Link** } Dedicated communication protocol **MODBUS** : The third supplier's communication protocol **Non Protocol** : Customized by users, completed with PLC programs, and communicated with other devices with RS instructions.		**Computer Link** : M , VB and VH Series PLC communication protocol **Baud Rate** :19200bps **Data Length** :7 bit (ASCII) **Parity** :EVEN **Stop bit** :1 bit
Power Require	DC24V±10% 70mA (External power supply required)			
Connection	Under the hood by the USB-A type or JST 4P connector	Terminal Block Connection		
Parameter Configuration Setting	Communication station number setting: designated by the Ladder Master (00~255).**	For selection of CP2 application types and relevant parameter configuration settings, please use the option "System – 2nd COM Port Setting... " of the developmental software Ladder Master.		Communication station number setting: designated by the turn knob switch on the left side of the module (00~99).

  *   The CP2 can be used for either RS-232 or RS-485 communication interface, the selective jumper is under the hood.

 ** Since the CP1 is designed for connect with Ladder Master or Neo-Touch, it is better to keep the station number as default value "0".

★ COM Port Instruction :

● **COM Port 1 (CP1)**

CP1 is a built-in RS-232 communication interface. It is available to use for either the USB-A type or the white JST 4P connector.

The communication application type for CP1 is the Computer Link, which is used for executing M, VB and VH Series communication protocol. Its main purposes are to:

1. Connect programmable tools (Computer + Ladder or PDA + NeoTouch)

2. Connect the Human-Machine Interface or SCADA(Supervisor Control And Data Acquisition).

3. Connect MODEM for remote program modification and data monitoring.

◎ After linking VB-CADP Module, the CP1 in main unit will be disabled, and its function will be replaced by the CP1 in VB-CADP.

● **COM Port 2 (CP2)**

CP2 is a multi-functional expansion communication port and can be used for implementation of various communication applications.

1. Computer Link – Uses M, VB and VH Series communication protocol and has the same purpose for use as CP1 in RS-232 interface. In RS-485 interface, the computer and several PLCs constitute the monitoring local access network.

2. CPU Link – Uses the dedicated communication protocol and is only available in RS-485 interface. CPU Link allows data exchange between 2~8 PLCs, usually used for the distributed control system.

3. Parallel Link – Uses the dedicated communication protocol and has the same purpose for use as CPU Link, except allowing data exchange between 2 PLCs with simple usage.

4. Easy Link – Uses M, VB and VH Series communication protocol. Basically this application type is similar to Computer Link, except which uses a M or VB Series PLC (called "Master PLC") to replace the computer, HMI or SCADA in the local network. In the Master PLC program we use the LINK instruction (FNC89) to access all the Slave PLC's data in the network for data exchange.

5. MODBUS – Uses the MODBUS communication protocol. MODBUS is a standard communication protocol. Usually all of the SCADA(Supervisor Control And Data Acquisition) and Human-Machine Interfaces will support MODBUS communication protocol. In case, if the devices without VB Series communication protocol, it can be link to VB Series PLCs with such an application.

6. MODEM Communication – Actively contacts with MODEM when the PLC boots up (MODEM's "AA" sign should light on), then exercises M, VB and VH Series communication protocol. By the linked MODEMs, the PLC allows to perform remote program modification or data monitoring.

7. MODEM Dialing – Uses the function of MODEM Communication above (if the dialing function of VB Series PLC and MODEM are activated) then triggers the PLC's Dial-up Connection to link with the other PLC. The function is very useful, especially for remote abnormality report, security system and data collector.

8. Non Protocol – It does not administer any specific communication protocol. All communication processes are customized and completed by PLC program. It uses RS instruction (FNC80) to receive and transfer communication operation. This communication type is usually used for links with other peripherals in the market, such as temperature controller, frequency converter or bar code reader.

● **COM Port 3 (CP3)**

CP3 is a RS-485 communication port which is expanded by the VB-CADP expansion module and the communication type is assigned as Computer Link (using the M,VB and VH Series communication protocol). It is usually linked with the Human-Machine Interface or the SCADA (Supervisor Control And Data Acquisition) to make the monitoring of local networking.

★ Appendix :

VB Series PLC has robust communication functions. It provides several communication operation modes that will achieve various applications such as LAN monitoring, disputed control, links to peripherals and MODEM communication. The communication operation modes of VB Series PLC are specified as follows:

◆ Computer Link

● The communication between PLC, Computer and the human-machine interface is enabled with M and VB Series communication protocol.
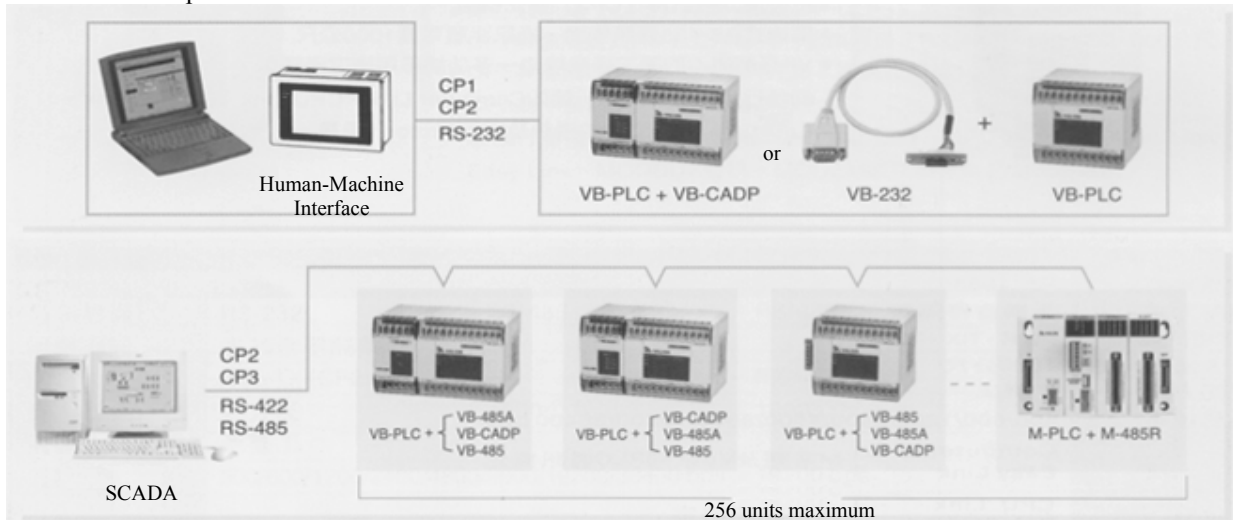
Item	Specification	
Communication Interface	RS-232	RS-422/RS-485
Communication Protocol	M, VB and VH Series Communication Protocol	
Communication Method	Semi-duplex	
Communication Parameter	Data Length: 7 bits (ASCII); Parity: EVEN; Stop Bit: 1 bit	
Baud Rate	CP1 and CP3: 19200 bps; CP2: 4800/9600/19200/38400 bps	
Communication Distance	15 M	1000 M (50 M, if a VB-485 exists in this communication loop)
Number of Link Stations	1 station	256 stations maximally (an additional power amplifier is required when there are more than 32 stations)
Connection Facility	CP1: Built-in Main unit CP2: VB-232 or VB-CADP	CP2: VB-485, VB-485A or VB-CADP CP3: VB-CADP M Series: M-485R
Linkable PLC	VB0 Series, VB2 Series, VH Series and M Series PLC	
Data Transfer Scope	Transferable, including all of X, Y, M, S, T, C and D	

◆ Easy Link
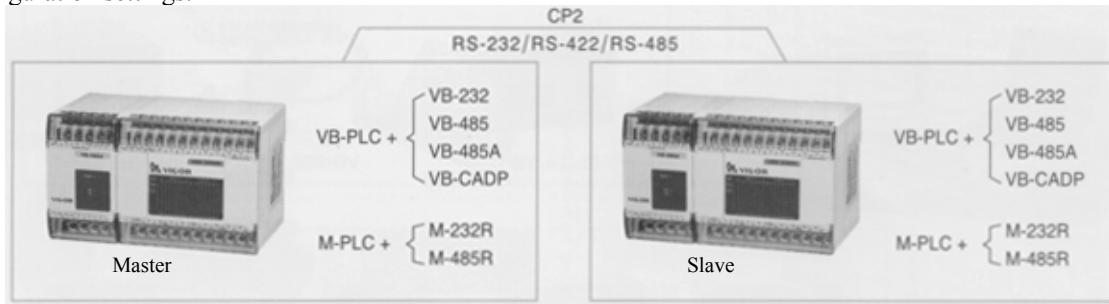
● PLC will enable VB Series communication protocol while the master's PLC programs control data transfer between PLCs.
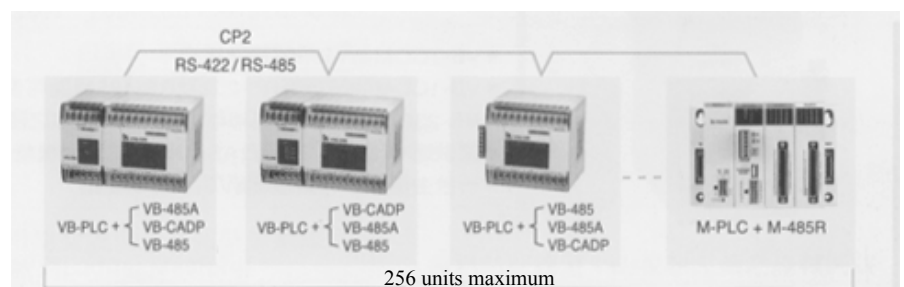
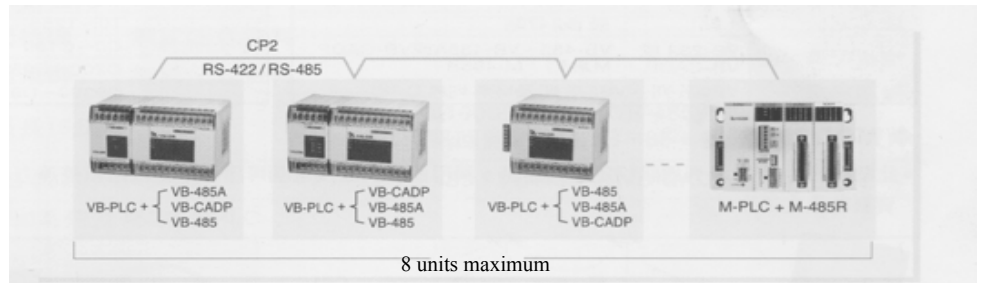| Item	Specification
Communication Interface	RS-422/RS-485
Communication Protocol	VB Series Communication Protocol (Same as M Series Communication Protocol)
Communication Method	Semi-duplex
Communication Parameter	Data Length: 7 bits (ASCII) Parity: EVEN Stop Bit: 1 bit
Baud Rate	4800/9600/19200/38400 bps
Communication Distance	1000 M (50 M, if VB-485 exists in the communication loop)
Number of Link Stations	256 stations max. (an additional power amplifier is required when there are more than 32 stations)
Connection Facility	VB Series: VB-485, VB-485A or VB-CADP
Linkable PLC	VB0 Series, VB2 Series and M Series PLC
Data Transfer Range	Transferable, including all of X, Y, M, S, T, C and D

◆ Parallel Link

● PLC will enable dedicated communication protocol, and two PLCs will transfer data automatically depending on configuration settings.

Item	Specification	
Communication Interface	RS-232	RS-422/RS-485
Communication Protocol	Dedicated Communication Protocol	
Communication Method	Semi-duplex	
Baud Rate	4800/9600/19200/38400 bps	
Communication Distance	15 M	1000 M (50 M, if a VB-485 exists in this communication loop)
Number of Link Stations	2 stations	
Connection Facility	VB Series: VB-232 or VB-CADP M Series: M-232R	VB Series: VB-485, VB-485A or VB-CADP M Series: M-485R
Linkable PLC	VB0 Series, VB2 Series and M Series PLC	
Data Transfer Range — Low Speed	Master→Slave: M800~899, D490~499 Slave→Master: M900~999, D500~509	
Data Transfer Range — High Speed	Master→Slave: D490, D491 Slave→Master: D500, D501	
Communication Time — Low Speed	73mS + Master Scan Time + Slave Scan Time (The value when Baud Rate = 19200 bps)	
Communication Time — High Speed	14mS + Master Scan Time + Slave Scan Time (The value when Baud Rate = 19200 bps)	

◆ CPU Link

● PLC will enable dedicated communication protocol, and PLCs in the network will transfer data automatically depending on configuration settings.
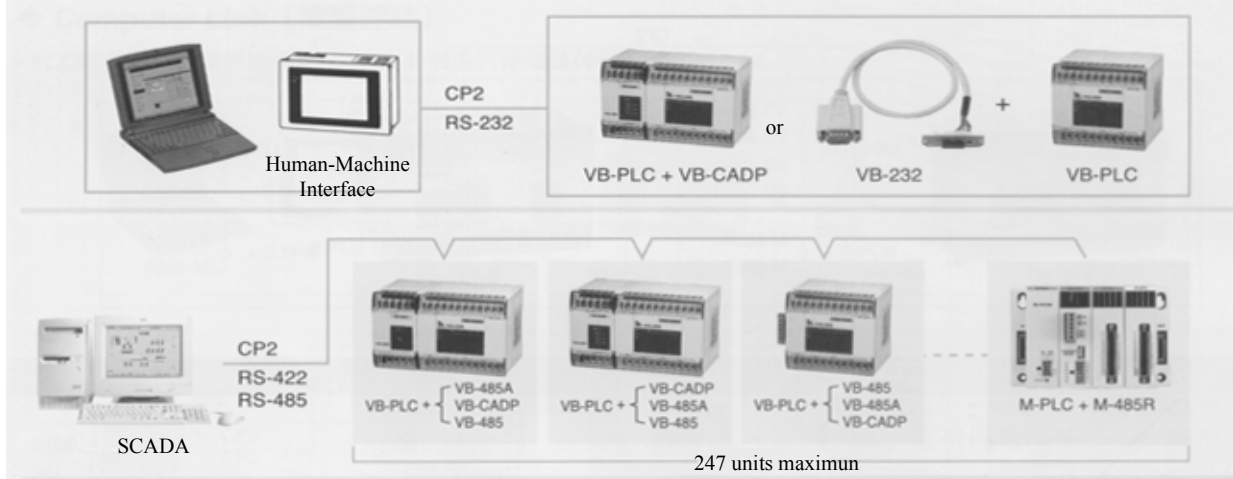

Item	Specification							
Communication Interface	RS-422/RS-485							
Communication Protocol	Dedicated Communication Protocol							
Communication Method	Semi-duplex							
Baud Rate	38400 bps							
Communication Distance	1000 M (50 M, if a VB-485 exists in this communication loop)							
Number of Link Stations	2~8 stations							
Connection Facility	VB Series: VB-485, VB-485A or VB-CADP; M Series: M-485R							
Linkable PLC	VB0 Series, VB2 Series and M Series PLC							

Data Transfer Range	Station No.	0 (Master)	1 (Slave)	2 (Slave)	3 (Slave)	4 (Slave)	5 (Slave)	6 (Slave)	7 (Slave)
	Mode 1	D0~3	D10~13	D20~23	D30~33	D40~43	D50~53	D60~63	D70~73
	Mode 2	D0~3	D10~13	D20~23	D30~33	D40~43	D50~53	D60~63	D70~73
		M1000~1031	M1064~1095	M1128~1159	M1192~1223	M1256~1287	M1320~1351	M1384~1415	M1448~1479
	Mode 3	D0~7	D10~17	D20~27	D30~37	D40~47	D50~57	D60~67	D70~77
		M1000~1063	M1064~1127	M1128~1191	M1192~1255	M1256~1391	M1320~1383	M1384~1447	M1448~1511

Communication Period	Number of Linked Stations	2 Stations	3 Stations	4 Stations	5 Stations	6 Stations	7 Stations	8 Stations
	Mode 1	7mS	11mS	15mS	19mS	23mS	27mS	31mS
	Mode 2	10mS	15mS	20mS	25mS	30mS	35mS	40mS
	Mode 3	16mS	24mS	33mS	42mS	50mS	59mS	68mS

◆ MODBUS Communication

● Communication between PLC, Computer and Human-machine Interface, etc. with MODBUS communication protocol.


Item	Specification	
Communication Interface	RS-232	RS-422/ RS-485
Communication Method	Semi-duplex	
Communication Parameter	Communication Mode: ASCII or RTU Data Length: 7 bits/ 8 bits Parity: None/Odd/Even Stop Bit: 1 bit/ 2 bits	
Baud Rate	300/600/1200/2400/4800/9600/19200/38400 bps	
Communication Distance	15 M	1000 M (50 M for VB-485)
Number of Link Stations	1 station	Up to 247 Stations
Connection Facility	VB-232 or VB-CADP	VB-485, VB-485A or VB-CADP; M Series: M-485R
Linkable PLC	VB0 Series, VB2 Series and M Series PLC	

Contrast of Component Number between VB-PLC and MODBUS

| Bit Component		Character Component	
VB-PLC Component No.	MODBUS Component No.	VB-PLC Component No.	MODBUS Component No.
X000~X177	10000~10127	D0~D8191	40000~48191
Y000~Y177	00000~00127	T0~T255	48192~48447
M0~M5119	00512~05631	C0~C199	48448~48647
S0~S999	05632~06631	C200~C255	48648~48759
T0~T255	06656~06911	D9000~D9255	48760~49015
C0~C255	06912~07167		
M9000~M9255	07424~07679		

◆ MODEM Communication

● This communication is implemented with VB Series communication protocol. Using this mode to monitor the computer allows remote monitoring of PLCs through telephone lines or system maintenance or data collection.
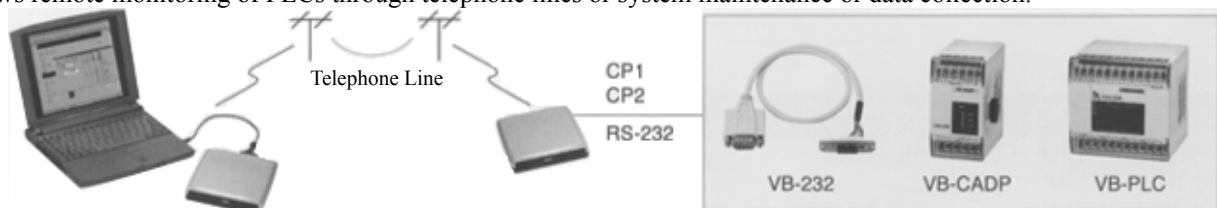
◆ **MODEM Dialing**

● VB Series PLC a telephone number register that can enable MODEM dialing function. Field monitoring of VB-PLC through MODEM dialing will transfer data to the monitoring center's VB-PLC for data collection, or dial the pager (BB CALL) and mobile phone for caller display.
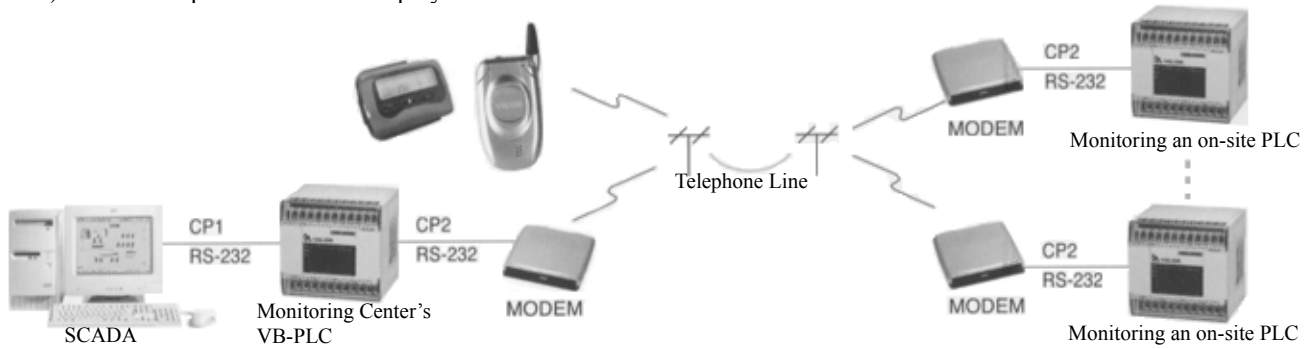
◆ **Non Protocol Communication**

● PLC does not enable any specific communication protocol. All communication processes are customized and completed with PLC programs. Combination with various commercially available facilities for communication is acceptable.
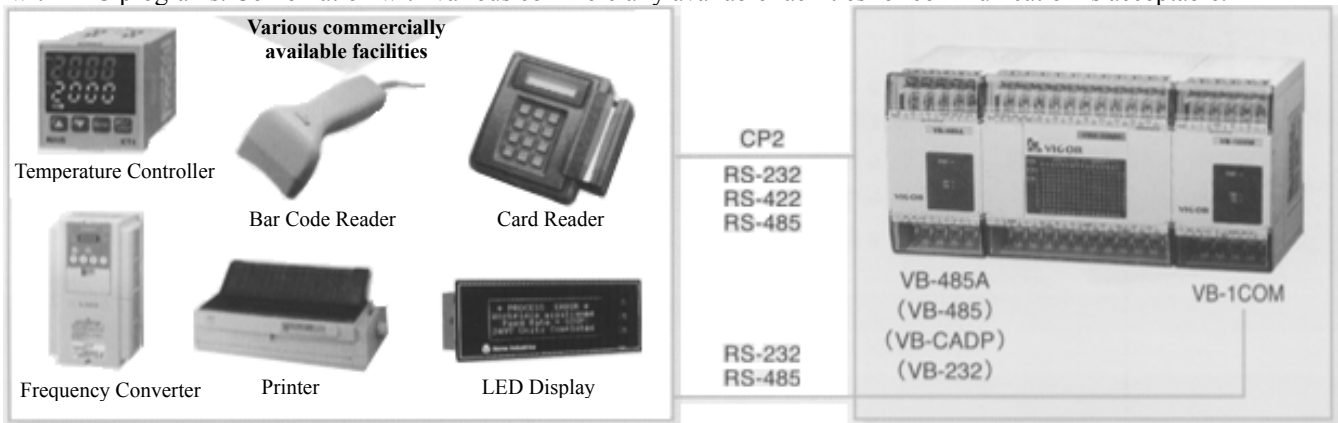
CP 2 Non Protocol Communication Specification

Item	Specification	
Communication Interface	RS-232	RS-422/ RS-485
Communication Protocol	Non Protocol	
Communication Method	Semi-duplex	
Communication Parameter (Please use the option "System – 2nd COM Port Setting... " of the developmental software Ladder Master.)	Baud Rate	300/600/1200/2400/4800/9600/19200 bps
	Data Length	7 bits/ 8 bits
	Parity	None/Odd/Even
	Stop Bit	1 bit/ 2 bits
	Initiation Code	None or arbitrary data
	Termination Code	None or arbitrary data
Communication Distance (reference of interfaced facility specification)	Up to 15 M	Up to 1000 M (50 M for VB-485) (50 M, if VB-485 exists in the communication loop)
Connection Facility	VB-232 or VB-CADP	VB-485, VB-485A or VB-CADP
Linkable PLC	VB0 Series and VB2 Series PLC	

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