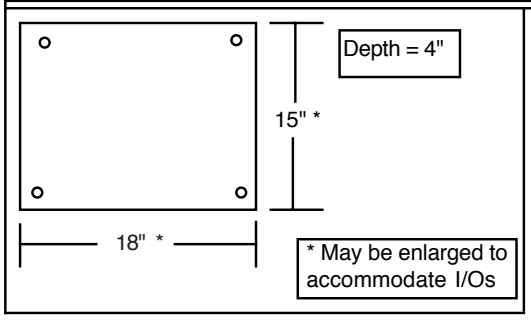
FUNCTIONAL DEVICES INC.

POWER-LINE CARRIER



MODEL CD

2-WAY COMMAND SYNTHESIZER

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DESCRIPTION

The CD Command Synthesizer interfaces with an EMS controller for control and interrogation of up to 512 each of DO, DI, AO and AI — assuming appropriate In/Out (I/O) boards are present. DO, DI, AO and AI are from the point of view of the EMS controller. The CD interfaces with the controller via wire connections, point per point, and the controller is not aware (except for slower response) that the PLC components are between it and the remote points being controlled and interrogated.

The CD is wired to CTR Command Transmitter/Receiver, which uses the existing ac wires or separate dedicated twisted pair for the PLC communication link to the Responders.

A unique digital code or identity (ID) is assigned to each EMS controller output. These same IDs are assigned to Responders (PLC receivers, which are located at the load being controlled or device being interrogated) by setting positions of switches on the Responders. A relay within the Responder ultimately controls the load. Verification of successful DO execution, switch contact status and analog values may be sent back to the controller when the appropriate add-on boards are combined in CD to make up a system. Analog output from the controller is also possible.

An LCD display indicates which Responder IDs are being addressed, which of the functions have been assigned to each Responder based on the presence of I/O boards (DO, DI, AI and/or AO), the present condition of DO, DI, AI and AO and the percentage of successful PLC communications being experienced to each two-way Responder.

FEATURES

- Allows controller to execute DO, DI, AO and AI via PLC (up to 512 each when utilizing correct add-on boards)
- CD wires to CTR, which uses existing ac wires or dedicated pair for the PLC communication path to the Responders
- Interfaces with controller via direct wires, point per point
- Can interface with almost any controller
- Excellent diagnostic features include a 32-character LCD display, 4 push buttons and 6 LEDs, which give the ability to determine the following:
  * The PLC communication efficiency to each 2-way Responder
  * The real-time status of DO, DI, AO and AI
  * The accomplished assignment of DO, DI, AO, and AI to each responder address

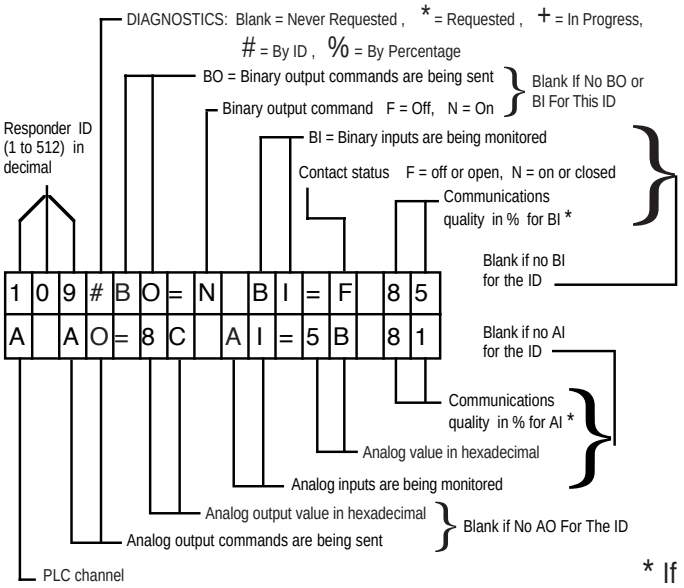
OPTIONS

CD Command Synthesizer is composed of various quantities of the following components:

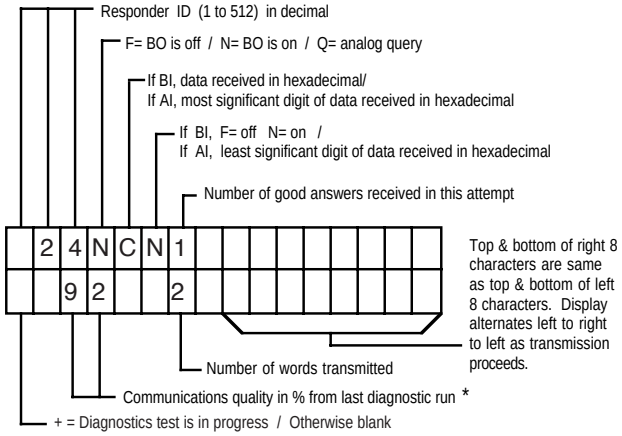
MODEL	DESCRIPTION	DO	DI	AO	AI
CDUP03	Base Unit Containing Microprocessor				
ACD54D	DO & DI I/O Board (allows 2 Piggybacks)	32	16		
ACD5N	DO Piggyback Board	32			
ACD4D	DI Piggyback Board		16		
ACD2AD	AO Piggyback Board			4	
ACD2DA	AI Piggyback Board				4
ACD4DA	AI Analog I/O Board (no room for a Piggyback)				16
ACD5DA	AI Analog I/O Board (no room for a Piggyback)				32

OPERATION

DIAGNOSTIC DISPLAY - To initiate diagnostics, press & release red & white buttons simultaneously. Plus (+) sign appears when diagnostics are running and changes to # or % when diagnostics are complete. Toggle between viewing by ID (#) or by percentage (%) by pressing & releasing brown button. To increment to the next Responder press & release the white button. To decrement to the previous Responder press & release the red button. Press & hold brown button to read Program Revision number.



REAL-TIME DISPLAY - Press & release blue button. Display alternates between left 16 characters (top 8 & bottom 8) and right 16 characters (top 8 & bottom 8). Press & hold blue button to freeze display.



* If AL appears in window communication quality is 100%

SPECIFICATIONS

- Separate wire connections to controller for each DO, DI, AO and AI on a point-per-point basis.
- Maximum delay in executing a changed DO or AO is 1.5 seconds + 0.5 second per each additional change.
- Contains alphanumeric diagnostic display, which indicates which Responder IDs are being addressed, which of the functions each Responder has been assigned (DO, DI, AI and/or AO), the present condition of DO, DI, AI and AO, and the percentage of successful PLC communications being experienced to each 2-way Responder.
- Accepts DOs from controller, which are relay, switch, NPN optoisolator or voltage, with open voltage of +5 volts and 5 mA required to represent a closed contact. For voltage input, use an IMCD for each16 DOs to CD.
- DIs to controller are reed relays rated at 200 VDC, 0.5 A, 10 VA.
- AOs from controller must be DC voltage (specify range within 0 to 11 Volts).
- AIs to controller are DC voltage (specify range within 1 to 5 volts).
- Has provisions for driving 4 CTRs (for additional CTRs use an IMCR5, as in drawing 4 on page 5)
- PLC communication has confirmation means, redundancy and continuous refresh commands.
- Power input is 120 Vac, 60 Hz, 5 watt from provided 120/16 Vac plug-in transformer.
- Operating temperature range is 32° to 120° F, storge temperature range is -40° to 185° F.
- Humidity range is 5 to 95% (noncondensing).
- Housed in metal housing (size dependent on number of I/O boards).
- Wiring diagrams and housing size (dependent on number of I/Os) are supplied with CD.
- UL listed under Standard 916 Energy Management Equipment. CSA Certified.