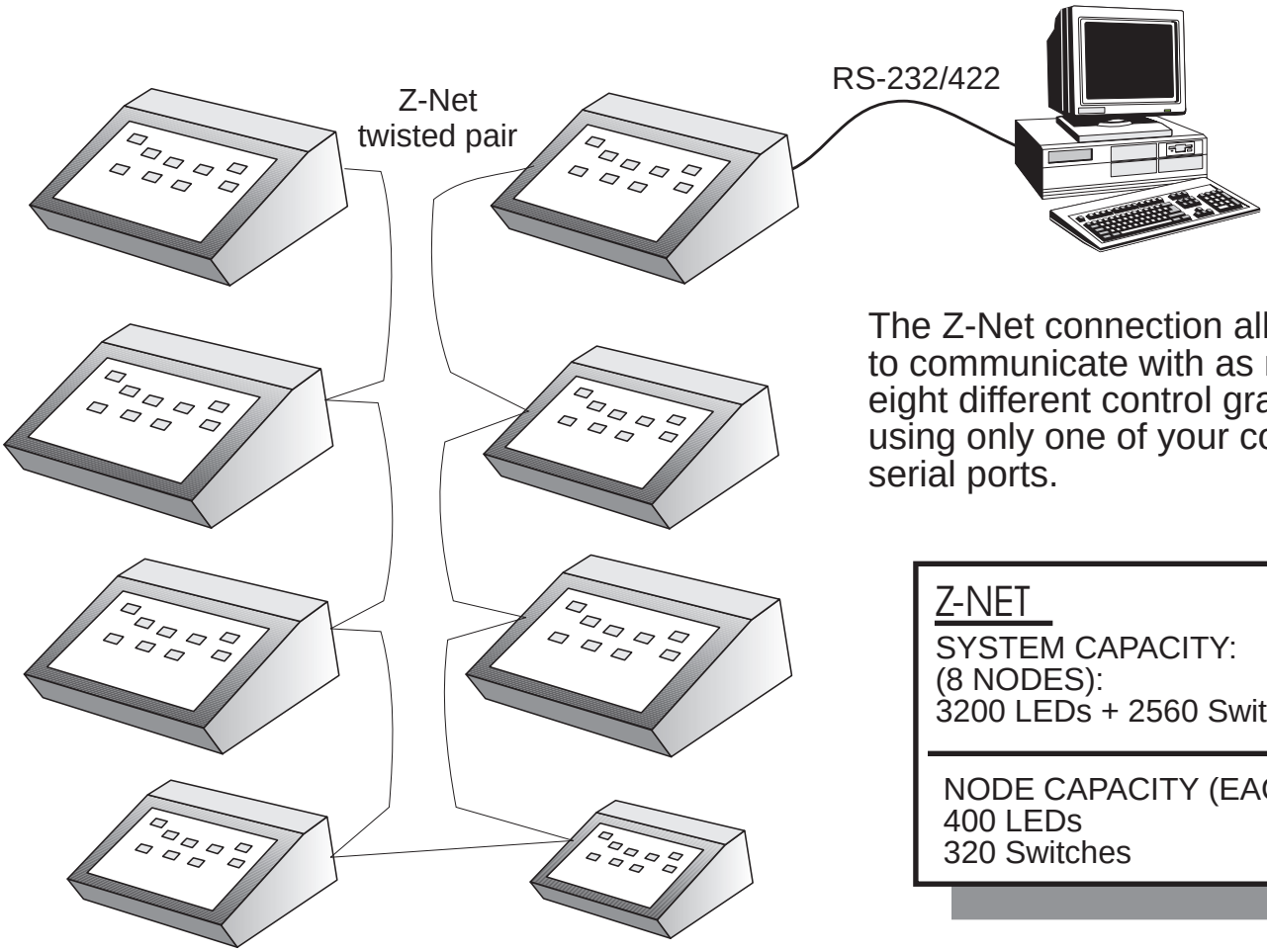
SPECIFICATION SHEET

Introducing...

The Z-Net communication network for Automation Displays' control panel applications

NEW FEATURES EASE INSTALLATION AND TESTING:

- Connect computer to any Z-Net node (one computer per Z-Net).
- Move computer to any other node- addresses stay the same, no re-configuration required.
- Run any single Z-Net node by itself, or with any combination of nodes. New nodes are automatically recognized- addresses stay the same - no re-configuration required.



The Z-Net connection allows you to communicate with as many as eight different control graphics using only one of your computer's serial ports.

Z-NET

SYSTEM CAPACITY:
(8 NODES):
3200 LEDs + 2560 Switches

NODE CAPACITY (EACH):
400 LEDs
320 Switches

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The Z-Net is an RS-485 serial asynchronous data communication protocol. It operates on Automation Displays' Z-Cards at 76800 baud, with eight data bits, no parity, and one stop bit per character. The protocol is interrupt-driven using 25-millisecond time slices. An entire worst-case update cycle of eight Z-Net nodes takes, including hardware refresh, takes nine time slices (0.225 seconds total). This update cycle refreshes 3200 LEDs and processes 64 switch events.

To read all 2560 possible switch inputs requires 40 update cycles (9 seconds total). Since a human operator will not be able to change the state of thousands of switches in a fraction of a second, operator inputs are generally processed within one update cycle or less (0.225 seconds). New switch activations are given first priority across the Z-Net.

Most systems have less I/O than the maximum of 3200 LEDs and 2560 switches that the Z-Net supports. The Z-Net gains speed by dropping unused nodes and polling the available nodes in their place.

The Z-Net periodically retries the unused nodes so that panels can be brought online or offline at any time without disturbing network operation.

The Z-Net is a master-slave protocol. The master node is the one that is also connected to the host computer or host PLC (programmable logic controller). There can only be one master on a Z-Net, but that master can be any Z-Net node, and can be changed at any time without requiring reboot or reconfiguration.

On power up, every node is a slave. When a node detects communication from a host, that node then becomes the Z-Net master. If host communication is subsequently lost, the node drops back to being a slave.

The advantage of this method is that any panel can be the master without requiring re-configuration. For example, a panel can be individually tested through a host PLC, and later connected in a multi-panel Z-Net system where another panel is the master.

SYNC =1-byte msg.
master-to-slave

1	1	1	1	0	1	1	1	F7

The SYNC message tells the slave to run LED refresh.

Z-NET LED msg.
master-to-slave

byte 0	0	0	0	0	0	n	n	n	Node addr nnn =0-7 (any node can be the master)
byte 1	d	d	d	d	d	d	d	d	LSb =LED 0, MSb =LED 7
byte 2	d	d	d	d	d	d	d	d	LSb =LED 8, MSb =LED 15
byte 3	d	d	d	d	d	d	d	d	LSb =LED 16, MSb =LED 23
byte 50	d	d	d	d	d	d	d	d	LSb =LED 384, MSb =LED 391
byte 51	d	d	d	d	d	d	d	d	LSb =LED 392, MSb =LED 399

Z-NET SWITCH msg.
slave-to-master

byte 0	1	1	1	1	0	0	0	1	**F1**
byte 1	0	0	0	0	0	n	n	n	nnn =node #(0-7)
byte 2	0	0	0	S	0	0	d	d	switch hi
byte 3	0	d	d	d	d	d	d	d	switch lo
byte 4	0	0	0	S	0	0	d	d	switch hi
byte 5	0	d	d	d	d	d	d	d	switch lo
byte 6	0	0	0	S	0	0	d	d	switch hi
byte 7	0	d	d	d	d	d	d	d	switch lo
byte 8	0	0	0	S	0	0	d	d	switch hi
byte 9	0	d	d	d	d	d	d	d	switch lo
byte 10	0	d	d	d	d	d	d	d	checksum (add bytes 1 thru 9, &with 7FH)
byte 11	1	1	1	1	1	1	1	1	**FF**

Switch messages are sent by slaves as a response to the master's LED message. Switch addresses are 9-bits, so valid switch numbers are 0-319. New switch events are placed on the Z-Net first. If necessary, the message is filled by refreshing the unchanged switches.

The "S" bit is switch state: 1=ON, 0=OFF.