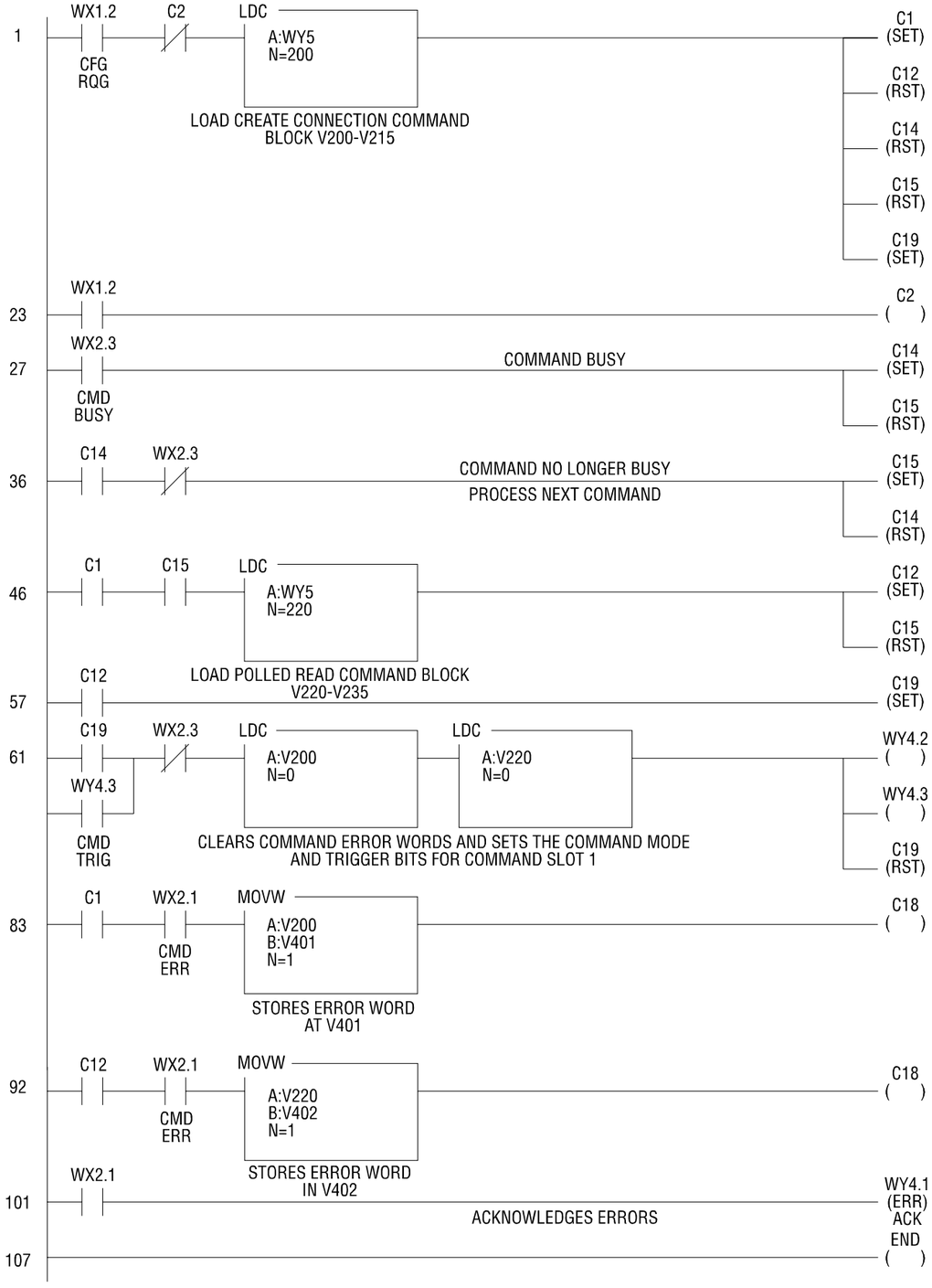
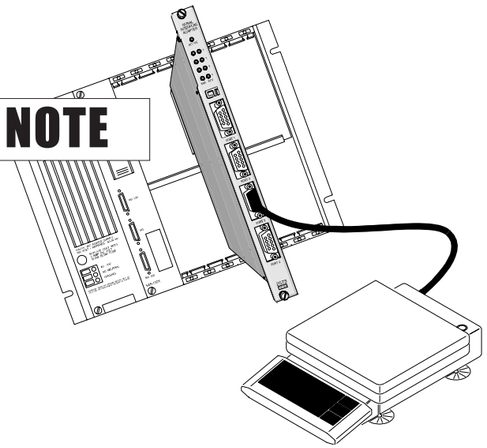


CONTROL TECHNOLOGY INC.
5734 Middlebrook Pike • Knoxville, TN 37921
Phone 1-800-537-8398 • FAX 1-865-584-5720
http://www.controltechnology.com • e-mail: sales@controltechnology.com

APPLICATION NOTE

2573-TCM2 Serial Interface Adapter to METTLER/TOLEDO PG5001 Scale



The CTI 2573-TCM2 Serial Interface Adapter is used to include the Mettler/Toledo PG5001 scale in a Simatic® 505 PLC system.

The following examples describe the configuration of the 2573-TCM2 to READ the weight values from the Mettler/Toledo PG5001 scale with the supporting ladder logic. This application uses the GAS Polled Read Command to send the SI command (send weight value immediately) and read the response from the scale.

The scale responds to the SI command in the following format:

S_S_WeightValue_Unit<CR><LF> (Stable Weight Value) or

S_D_WeightValue_Unit (Nonstable weight value)

In this example, only the weight value (whether stable or unstable) is parsed from the response and written into the PLC V memory as a Real Number.

NOTE: ***This example shows the ladder logic and command blocks necessary to configure Port 1 of the 2573-TCM2 to communicate with the Mettler Toledo PG5001 scale. Additional ports may be configured by creating additional ladder logic and command blocks.***

DIP SWITCH SETTINGS

(Ref. CTI 2573-TCM2 IOG Section 2.3)

For this example setting the Port Protocol via Dip Switch is required for Port No. 1. Set switches 6, 7, and 8 for PLC Select configuration to allow the General ASCII Support (GAS) Protocol Manager to be initiated by the ladder logic using the Create Connection Command Block.

PLC COMMAND INTERFACE

(Ref. Appendix D of the 2573-TCM2 Installation and Operation Guide)

In this example, the 2573-TCM2 is logged into the 505 I/O Base in Slot No. 1. The 2573 logs into the CPU memory as a Special Function Module with 2WX and 6 WY. The following addresses are used: WX1, WX2, WY3, WY4, WY5, WY6, WY7, WY8.

PLC ladder logic controls the 2573 by placing pointers in WY registers to tables stored in V memory. Command triggers are controlled via RLL to "wake up" the 2573 and capture the instructions from V memory. Areas of V memory called **Command Blocks** are used to store the command parameters.

COMMAND BLOCKS

In this application V memory values contain the parameters in the **Command Blocks** necessary to send a command and read the ASCII input string and to parse the weight from the Mettler/Toledo PG5001 scale.

P/N 06200226v1.0 051303

CREATE CONNECTION COMMAND (V200 - V215)
(Ref. CTI General ASCII Support Protocol Manager Reference Manual Section 2.2)

The Create Connection Command starts the GAS protocol manager and creates a physical connection to Port No. 1 of the 2573. The communication parameters are set up for the port. These should match the communication parameters of the Mettler/Toledo PG5001 scale attached serially to the module port. The communication parameters are: 9600 baud, 8 bits, no parity, one stop bit, no handshaking.

POLLED READ COMMAND (V220 - V235)
(Ref. CTI General ASCII Support Protocol Manager Reference Manual Section 2.6)

The Polled Read Command tells the 2573 to first write an ASCII string out the port to the attached device and wait for the device to respond with an input message. The contents of the output message sent to the device is determined by the Format Specification Table located at the V memory address in offset 4 position (V224) of the Polled Read Command. How the input message is to be read is determined by the Format Specification Table located at the V memory address in offset 6 (V226). The message maximum length expected is determined by the value in offset 9 (V229). Offset 10 (V230) determines the start and end delimiters for an input message. In this case, V230 has the value 530A hex (ASCII **S** and **LF**). So any message beginning with an "**S**" and ending with a "**LF**" will be read into the input buffer.

OUTPUT FORMAT SPECIFICATION 3001 (V241 - V250)
(Ref. CTI General ASCII Support Protocol Manager Reference Manual Section 3.17)

This specification tells the GAS protocol manager to begin at position 1 in the output buffer and send the message **SI<CR><LF>** stored in V245 and V246. The value at V245 = 5349 hex (ASCII **S** and **I**). The value at V246 = 0D0A hex (ASCII **CR** and **LF**).

INPUT FORMAT SPECIFICATION 1002 (V261 - V270)
(Ref. CTI General ASCII Support Protocol Manager Reference Manual Section 3.10)

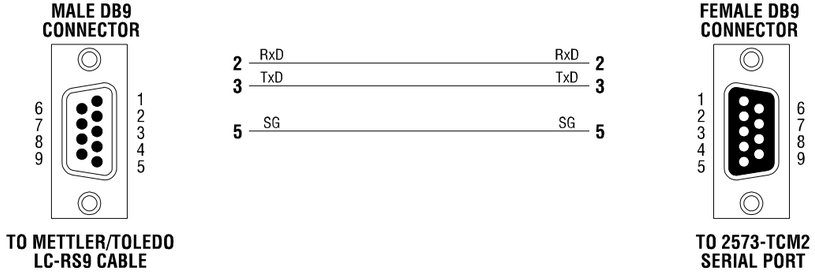
This specification tells the GAS protocol manager to begin at the fourth position in the input buffer (V262 = 4), read a variable length Real Number (V263 - 65535 or -1) and write the Real Number value at V266 and V267.

NOTE: ***A real number takes 2 words of V memory. The value can be displayed in Real Number format at V266.***

NOTE: ***A format specification table must begin with a signature value of 4C00 hex (19456 integer) and must end with 65000 integer.***

(Ref. CTI General ASCII Support Protocol Manager Reference Manual Chapter 3)

NOTE: ***The 9 pin serial cable from the PG5001 will not connect directly to the 2573-TCM2 serial port. The PG5001 cable straps signal lines that are used by the 2573 serial port for RS-422 communication. Using the diagram below a cable can be constructed that eliminates all lines except TXD, RXD, and SIG GND.***



LADDER LOGIC EXAMPLE

The ladder logic example, used in relationship with V memory Command Blocks, creates a connection (V200) to Port No. 1 of the 2573 on first power up. Then a Polled Read Command (V220) is executed on completion of a PLC scan cycle. Command errors are monitored at V200 and V220 of the respective Command Blocks. If an error occurs, the error code is moved to V401 and V402 respectively for examination. The error conditions are acknowledged and another command cycle begins.

I/O CONFIGURATION CHART FOR CHANNEL . . . 1 BASE 00

		I/O POINTS							
		1	2	3	4	5	6	7	8
SF	SLOT 1	WX0001	WX0002	WY0003	WY0004	WY0005	WY0006	WY0007	WY0008
	SLOT 2								
	. . . . .								
	. . . . .								
	SLOT 15								
	SLOT 16								

2573-TCM2 TO METTLER/TOLEDO PG5001

CREATE CONNECTION

V200	INTEGER	00000
V201	INTEGER	00001
V202	INTEGER	19221
V203	INTEGER	00038
V204	INTEGER	00001
V205	INTEGER	09600
V206	INTEGER	00008
V207	INTEGER	00000
V208	INTEGER	00001
V209	INTEGER	00000
V210	INTEGER	00000
V211	INTEGER	00000
V212	INTEGER	00000
V213	INTEGER	00000
V214	INTEGER	00000
V215	INTEGER	00000

POLLED READ COMMAND

V220	INTEGER	00000
V221	INTEGER	09731
V222	INTEGER	19221
V233	INTEGER	00000
V224	INTEGER	00240
V225	INTEGER	00000
V226	INTEGER	00260
V227	INTEGER	00000
V228	INTEGER	00000
V229	INTEGER	00020
V230	HEX	530A
V231	INTEGER	00000
V232	INTEGER	00000
V233	INTEGER	00000
V234	INTEGER	00000
V235	INTEGER	00000

OUTPUT FORMAT SPECIFICATION

V240	INTEGER	19456
V241	INTEGER	03001
V242	INTEGER	00001
V243	INTEGER	00004
V244	INTEGER	00000
V245	HEX	5349
V246	HEX	0D0A
V247	INTEGER	00000
V248	INTEGER	00000
V249	INTEGER	00000
V250	INTEGER	00000
V251	INTEGER	65000

INPUT FORMAT SPECIFICATION

V260	INTEGER	19456
V261	INTEGER	01002
V262	INTEGER	00004
V263	INTEGER	65535
V264	INTEGER	00000
V265	INTEGER	00000
V266	REAL	+0.00000
V267		
V268	HEX	0020
V269	INTEGER	00000
V270	INTEGER	00000
V271	INTEGER	65000