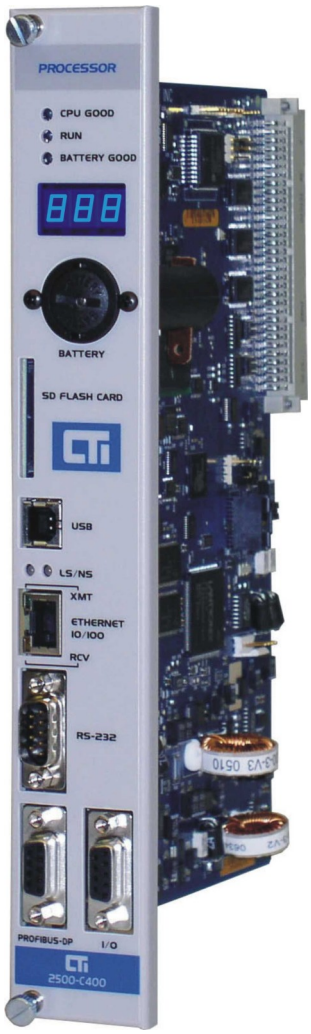
2500 Series® PLC System
Product Bulletin

CTI 2500 Series®
Programmable Controllers

Classic



DESCRIPTION

The 2500 Series® Controllers bring exciting new features and a new level of process performance to Simatic® 505® Control Systems. The C100 and C200 models easily handle medium to large discrete control applications, as well as basic process applications. The C300 and C400 models are equipped to handle large process applications with many PID loops and alarms and special mathematical functions. The 2500 Series® Controllers are designed to seamlessly replace all Simatic® 545 and 555 controllers while providing much higher performance at lower cost. The controllers are supported by a complete range of digital, analog, and specialized I/O modules, power supplies, and I/O bases, all available from CTI.

FEATURES

- Replaces all Simatic® 545 and 555 models
- Built-in Ethernet and USB ports for programming
- Built-in SD Flash card for firmware update from flash
- Built-in Profibus and RS485 Remote I/O on C200, C300, and C400 models
- Up to 3Mbytes memory, 8192 I/O points, 512 PID loops & 512 alarms, depending on model
- Programmable using Workshop
- Integrity® Real Time Operating System for high-reliability and security

SPECIFICATIONS

Ports:
Ethernet, 100Mbit, RJ45
RS232C: DB9 male
Profibus: 12Mbit, DB9 female
Remote I/O: DB9 male
SD Flash card: up to 32G bytes (with Firmware V6.18 and higher)
Expansion port: future use

User Memory:
2500-C100: 128K
2500-C200: 256K
2500-C300: 512K
2500-C400: 3072K

Loops / Alarms:
2500-C100: 16 / 32
2500-C200: 64/ 128
2500-C300: 512 / 512
2500-C400: 512 / 512

Status Display: 3-Digit LED display for system status, error reporting and IP address
Backplane Power: 7 Watts (maximum)

Operating Temperature: 0° to 60°C
Storage Temperature: -40° to 85°C
Relative Humidity: 5% to 95%

Agency Approvals: CE, UL UL-C, Class 1 Div 2
Shipping Weight: 1.5 lb. (0.68 Kg)

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ROCK SOLID PERFORMANCE. TIMELESS COMPATIBILITY.

IMPORTANT NOTE: This product includes a lithium battery for backing up the user program, retentive variables, and system diagnostics. For safety in transportation, the battery is installed but disabled. Prior to putting this product into service, you MUST move dipswitch SW1 to the CLOSED position to enable the battery.

COMPATIBILITY OVERVIEW

The CTI 2500 Series® Processor is designed to be compatible with customer applications that use the Simatic® 545 and 555 controllers. While the CTI 2500 matches or exceeds the capabilities of these processors in most aspects, there are a few areas in which the CTI 2500 operates differently.

Relay Ladder Logic

The RLL used in the controller provides equivalent instructions for all Simatic® 555 instructions except the XSUB instruction. External subroutines are not supported. If you download a program containing the XSUB instruction, it will be ignored. In many cases XSUB is used for communications with Siemens® Profibus HMI panels. For these installations we have a CTI program free on our website which replaces the XSUB. For XSUB uses other than Siemens® HMI panels, CTI and our partners can develop XSUB replacement software using SF programming. Please contact us.

Special Function Programs

The controller compiles all SF programs and subroutines. They are compiled in the following situations:

- When a user program is downloaded to the PLC, if the SF Program or subroutine is enabled,
- When the SF program or subroutine is enabled, if the SF program has been modified,
- During a Power Up start (following the application of power).

Programs that contain errors will not be enabled. During a program download, Workshop will display a message indicating the error. Once you acknowledge the message, the download will continue, leaving the program disabled. You must correct the programming error before the program or subroutine can be enabled. User Programs originally written for the Simatic® 505 PLC may contain undetected errors, if the programs were not originally compiled. This can occur because the SF interpreter never attempts to execute the instruction due to the branching logic. A common problem is that additional ENDIF statements are included or the correct number of ENDIF statements is not present.

Unlike the Simatic® 555, there are no restrictions regarding the instructions that can be used in a compiled program.

User Configuration

The following differences in the user configuration should be noted:

1. Allocation of CS memory is not supported. The CTI 2500 controller uses high speed DRAM to store and execute compiled SF programs and subroutines. Consequently, CS memory is not required.
2. User allocation of User Subroutine memory is not supported. The CTI 2500 controller does not support user subroutines (XSUB). See XSUB description above.
3. A time slice for Report by Exception (RBE) is not supported. Some alternative solutions exist. Please consult us with your exact configuration.
4. A new time slice, Network Communications, has been added to support the local Ethernet port.

I/O Support

The following are not presently supported. This is subject to change.

- Interrupt I/O

Support of Special Function Modules

Most CTI and Siemens special function modules are supported. A complete list showing the compatibility status by module part number is maintained in the Technical Advisory which can be found here:

http://www.controltechnology.com/Files/Products/technical-advisory-(restricted)/2500-Cxxx-technical-advisory1

Ethernet Support

All 2500 Series® Processor models include a built-in Ethernet port which is compatible with the ports on the CTI 2572 and 2572-A Ethernet Adapters. The capabilities of the Ethernet port on the processor differs slightly from those of the ports on the Ethernet Adapters. The table below summarizes the features included on each product.

Comparing 2500 Series® Ethernet Solutions

	2572	2572-A	2572-B	2500-Cxxx / 2500C-Cxxx	2500P-ECC1	2500P-ACP1	2500P-JACP	2500P-J750 / 2500C-J750	Siemens 505-CP1434-TF	Siemens 505-CP1434-TCP
Applications Supported										
Programs with				Workshop, TISoft, APT	ECC1 Configurator	Workbench (Jsoft)	Workbench (Jsoft)	Workbench (Jsoft)		
PLC programming	✓	✓	✓						✓	✓
HMI/SCADA access	✓	✓	✓	✓	✓		✓[11]	✓[11]	✓	✓
Peer-peer (CAMP)	✓	✓	✓	✓[6]	✓	✓	✓	✓		✓
Peer-peer (other)	✓[1]	✓[2]	✓[2]		✓[2,3]	✓[2,3]	✓[2,3]	✓[2,3]	✓	
Communication to SIMATIC/TI 505® CPU over the backplane	✓	✓	✓			✓	✓		✓	✓
Communication to Rockwell PLCs		✓[4]	✓[4]			✓[5]	✓[12]	✓[12]		
Communication to S7	✓									✓
Email	✓									✓
Communication to Modbus TCP devices		✓[9]	✓[9]		✓	✓	✓	✓		
Communication to Ethernet/IP devices		✓[4]	✓[4]			✓[5]	✓[12]	✓[12]		
Performance in CTI standard SCADA test										
Packets sent/received per second [10]	68	102	102	199	989	N/A	N/A	N/A	N/A	N/A
Protocols Supported										
505 Ethernet (aka CAMP, NITP)	✓	✓	✓	✓[7]	✓	✓[8]	✓	✓		✓
Multicast		✓	✓		✓	✓	✓	✓		
Data Cache with 2500-Cxxx PLCs					✓	✓	✓	✓		
Network Data Exchange					✓	✓	✓	✓		
Data Share	✓									
Modbus-TCP		✓[7]	✓[7]		✓	✓	✓	✓		
Ethernet/IP		✓[4]	✓[4]			✓[5]	✓[12]	✓[12]		
H1									✓	
Communicates Directly With (Over Ethernet)										
2572	✓	✓	✓	✓	✓	✓	✓	✓		✓
2572-A	✓	✓	✓	✓	✓	✓	✓	✓		✓
2572-B	✓	✓	✓	✓	✓	✓	✓	✓		✓
2500 Series® CPUs	✓	✓	✓		✓	✓	✓	✓		✓
2500P-ECC1	✓	✓	✓	✓	✓	✓	✓	✓		✓
2500P-ACP1	✓	✓	✓	✓	✓	✓	✓	✓		✓
2500P-JACP						✓	✓	✓		
2500P-J750 CPU						✓	✓	✓		
505-CP1434-TF									✓	
505-CP1434-TCP	✓	✓	✓	✓	✓	✓	✓	✓		✓
Other										
For Direct Use with SIMATIC TI505®	✓	✓	✓			✓	✓		✓	✓
Webserver for diagostics		✓	✓	✓	✓	✓	✓	✓		
OPC/DDE support	✓	✓	✓	✓	✓		✓	✓	✓	✓
100Mbit speed		✓	✓	✓	✓	✓	✓	✓		
1000Mbit speed							✓	✓		
Availability										
Manufactured and supported			✓	✓	✓	✓	✓	✓		
Support Only	✓	✓								

Notes V3.2

[1] Datashare protocol

[2] IP Multicast

[3] Network Data Exchange

[4] Supports accessing V memory using CIP DATA TABLE READ and CIP DATA TABLE WRITE messages

[5] Supports connections to Ethernet/IP devices via I/O Scanner, I/O Adapter, Explicit Message Adapter, and Tag Client interfaces

[6] CPU supports "server only" for peer-peer

[7] Supports "server" operation only

[8] Supports "client" operation only

[9] Supports "slave" operation only

[10] Tested with Kepware OPC Server, 3 connections from 2 different PCs, each connection polling 1000 C's and 1000 V's at 10msc speed, 30msec PLC scan

[11] Using OPC-UA or CAMP Server

[12] Supports connections to Ethernet/IP devices via I/O Scanner, I/O Adapter, Tag Client/Server, Explicit Message Client/Server, and Flex I/O Client

Ethernet Access

Port 4452: One TCP connection for programming software. This port receives priority in communications.
Ports 1505 or 4450: Three TCP connections for data access.

2500-Cxxx Programmable Controllers Model Comparison

Feature	2500-C100	2500-C200	2500-C300	2500-C400
User Program RAM	128K	256K	512K	3072K
Discrete I/O Points	1024	2048	8192	8192
Word I/O Points	1024	1024	8192	8192
Control Relays	4096	32,768	32,768	32,768
Retentive Control Relays	1024	4096	4096	4096
Timers/Counters	1024	20,480	20,480	20,480
Compiled SF	Yes	Yes	Yes	Yes
Cyclic PID Loops	16	64	128	128
RLL PID Loops (Fast Loops)	0	0	384	384
Analog Alarms	32	128	512	512
Special Function Programs	64	1023	1023	1023
Special Function Subroutines	64	1023	1023	1023
Remote I/O	None	Up to 15 bases	Up to 15 bases	Up to 15 bases
Profibus I/O	None	Up to 112 bases	Up to 112 Bases	Up to 112 Bases
Maximum Serial Port Data Rate	115.2K	115.2K	115.2K	115.2K
On-board User Flash	Yes	Yes	Yes	Yes
Local Ethernet Port	Yes	Yes	Yes	Yes
USB Port	Yes	Yes	Yes	Yes
Battery	5yr storage (0-60C), 3yr continuous@25C, 6mos@60C			