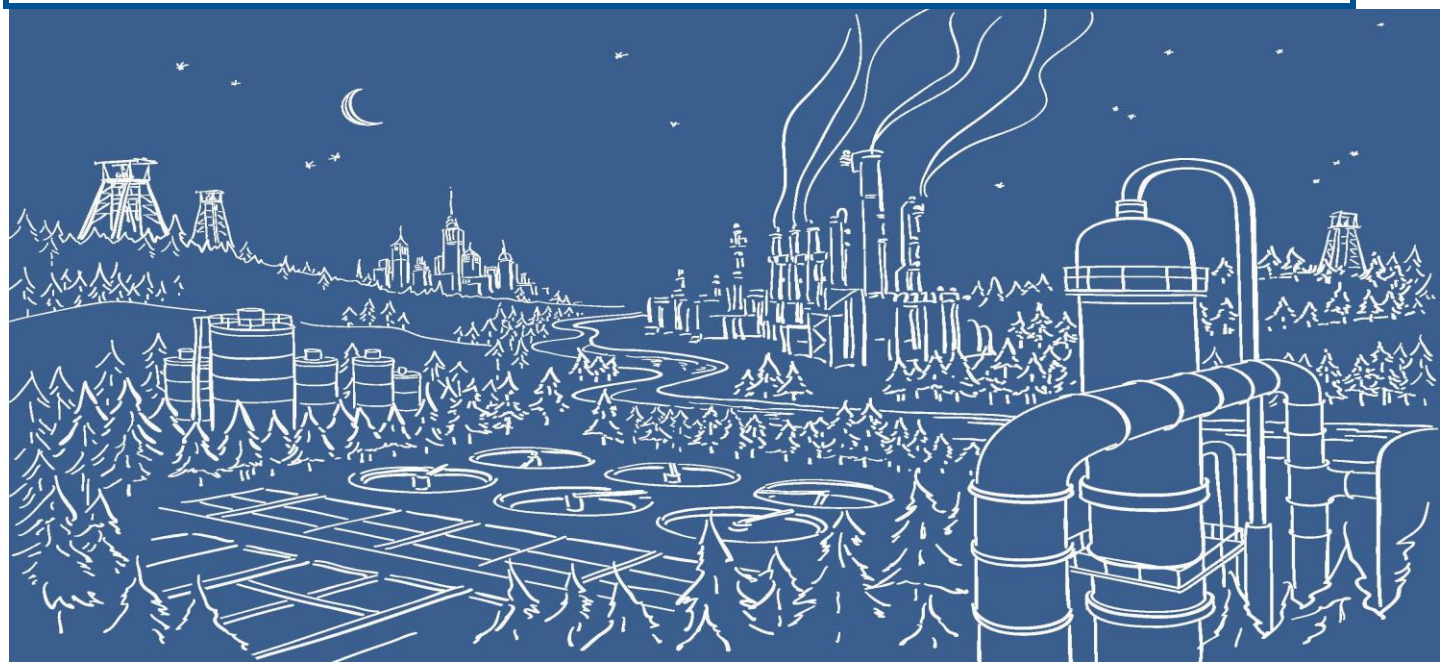
Application Note



CTI Processors & Access to Important Runtime Heath Parameters

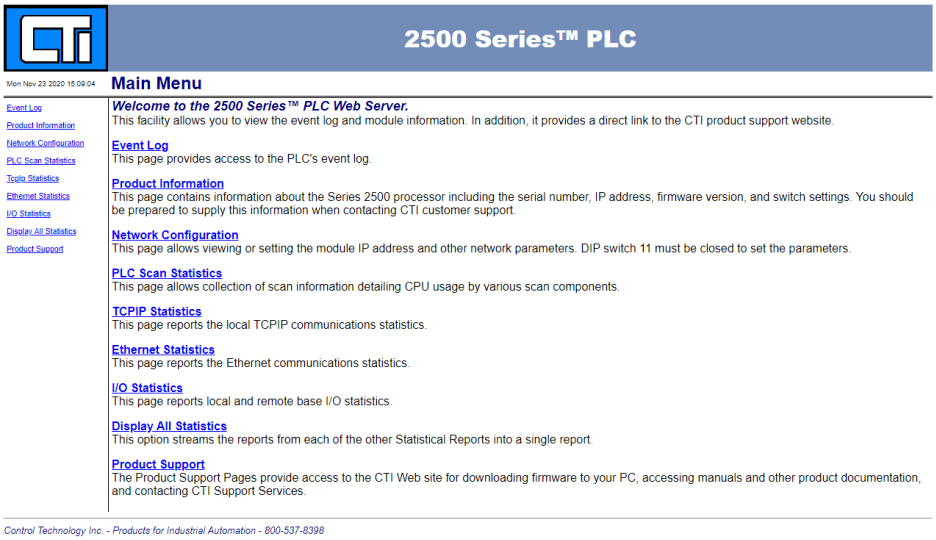
All CTI processors include built-in Ethernet ports and offer access to extensive diagnostic information on the processor health and operation. There are two separate parts to the diagnostic information. One is through the pages available from the processor Web Server, and the other is through the STATUS WORD memory area which can be viewed using Workshop.

WEB SERVER access

You can access pertinent information through the integrated WEB page interface. To access these pages, you simply type in the IP address of the CPU from any web browser which is located on your PLC network. From this page you will have a snapshot of different parameters related to the well-being of your system. Below is a picture of the CPU Webserver Main Menu page.

From this page you can retrieve Information related to:

- Product information
- Network Configuration
- PLC Scan Statistics
- TCP Ethernet Statistics
- I/O Statistics
- Event Log



Product information offers access to information like:

- CPU model
- CPU S/N
- F/W revision
- Ethernet port configuration
- Serial Port configuration
- Dip Switch settings

Other web pages offer access to global communication parameters including Ethernet communication parameters, I/O status, and an Event Log (where the last 1000 events are logged and stored).

Product Information

This page allows you to view product information including the product serial number, current IP address, current firmware version, and switch settings.

```
Product Number ..................... 2500-C400
Product Name ....................... CTI 2500 PLC
Serial Number ...................... 000240791
Manufacturing Date ................. 03/14/2011
Ethernet MAC Address ............... 00:20:25:0F:90:96
IP Address ......................... 192.168.2.98 /24
Subnet Mask ........................ 255.255.255.0
Gateway.... ........................ 0.0.0.0
Hardware Configuration ............. 0x0
Application Firmware Version ...... 09.16
Application Firmware Date ......... 9/19/18
I/O CPLD Version Number............. 06.02
Serial Port Baud Rate.............. 115200
Dipswitch Settings ................. 0x440
   2 Serial Port Baud Rate-SW2 ..................................... closed
   3 Serial Port Baud Rate-SW3..................................... open
   4 Serial Port Baud Rate-SW4..................................... open
   5 Serial Port RS232/RS422  Open=RS232     Closed RS422..... open
   6 TCP Programming Port     Open=4452      Closed=1505/4450.. closed
   7 Disable Standby Base Polling       Closed=Disable Polling.. open
   8 Disable Unconfigured Bases         Closed=Disable Bases.... open
   9 Reserved ..................................................... open
  10 Remote I/O Interface     Open=RS485     Closed=Coax..... open
  11 Set IP Address via local port/web page  Closed=Enabled.... open
  12 Firmware Update                 Closed=Enable..... open
User Jumper Settings ............... 0x3f
   A APT Memory (C400): Open=1856K        Closed=2048K..... open
   B Serial Port Use:   Open=Programming  Closed=Printer Port.. open
   C EnetPort I/F Mode: Open=Fixed(MDI)   Closed=Auto Crossover open
   D Reset to default IP Address at boot  Closed=Reset..... open
   E Reserved...................................................... open
   F Reserved...................................................... open
Product Clock ...................... Mon Nov 23, 2020   14:16:05.099
```

Tcplp Statistics

Clear

Clear will reset collected values to zero.

```
          Current Time:        Mon Nov 23, 2020   14:20:22.778
          Last Counter Clear:  Mon Nov 23, 2020   14:01:43.127

IP address ....................................... 192.168.2.98
Subnet mask ...................................... 255.255.255.0
Default router IP address ........................ 0.0.0.0
Keep-Alive value ................................. 15
Max TCP Server Connections Allowed .............       12
  Port 4450/1505 TCP Server Connections ........        3
  Port 4452 TCP Server Connections .............        1
  Total active TCP Server Connections ..........        0
Port 4450/1505 TCP Active Server Connections ...        0
Port 4450/1505 TCP Server Packets Received .....        0
Port 4450/1505 TCP Server Packets Transmitted ..        0
Port 4450/1505 TCP Server Connections Accepted .        0
Port 4450/1505 TCP Server Connections Rejected .        0
Port 4452 TCP Active Server Connections ........        0
Port 4452 TCP Server Packets Received ..........        0
Port 4452 TCP Server Packets Transmitted .......        0
Port 4452 TCP Server Connections Accepted ......        0
Port 4452 TCP Server Connections Rejected ......        0
```

Ethernet Statistics

Clear

Clear will reset collected values to zero.

```
          Current Time:        Mon Nov 23, 2020   14:20:22.864
          Last Counter Clear:  Tue Oct 23, 2018   10:08:58.127

Link Status ..................................... Active
Interface Speed ................................. 100 Mb
Duplex Mode ..................................... Full
MII Control Register: Startup = 0  Current = 1000
Ethernet MAC Address ............................ 00:20:25:0F:90:96

Total Packets Received .....................        362237
CTI RAW 873A Packets Received ..............             0
CTI RAW 873A Packets Transmitted ...........             0
Unicast Packets Received ...................        113228
Broadcast Packets Received .................        249009
Packets Sent to Stack ......................         96142
Total Packets Transmitted ..................        113450
Broadcast Packets Transmitted ..............             0
Ethernet Discarded Packets Statistics:
  No Buffer Descriptor .....................             0
  Due to Error .............................             0
  Unsupported Port Number ..................            75
  Unsupported ARP ..........................        221491
  Unsupported IP Broadcast .................         27481
  Unsupported Unknown Broadcast ............             8
  Unsupported Multicast ....................             0
  Unsupported UDP Packets ..................         17038
  Total Discarded Packets ..................        266093
Ethernet Transmit/Receive Errors Statistics:
  Total Collision Retry Limit Count ........             0
  Late Collision Count .....................             0
  Buffer Descriptor Error Reset Count ......             0
  Packet Frequency Reset Count .............             0
  Rx FIFO Error Reset Count ................             0
  Rx FIFO Error Could Not Reset Count ......             0
  Tx FIFO Error Reset Count ................             0
  Tx FIFO Error Could Not Reset Count ......             0
  Graceful Stop Complete Reset Count .......             0
Ethernet Packet Storm Statistics:
  Packet Storms Detected Count .............             0
  Packet Storms End Detected Count .........             0
  Packets Per 50 ms Value Recorded .........             0
  Ethernet Storm Duration:(In Seconds) .....          0.00
  Time The Last Storm Ended: Thu Jan 01, 1970   00:00:00.000
```

Event Log

Top | Page Up | Page Down | End | Clear Log | View All

[0876] Ethernet: Link Active, Current IP Address: (P=0x0e40001c)
Text: 192.168.2.98
Mon Nov 23, 2020 14:12:27.161 *Kernel_AP: ArpDuplpClient*

[0875] Ethernet: Link Inactive! (P=0x0e40005c)
Text: Enet Port
Mon Nov 23, 2020 14:01:43.127 *Kernel_AP: FECRstMonitor*

[0873] PLC Starting; Firmware Major Rev: 9 (P=0x0440003a)
Minor Rev: 16 (S=0x04200036)
Release Date: (T=0x04100029)
Text: 9/19/18
Extended Text: Board Serial Number: 000240791
Mon Nov 23, 2020 14:01:41.168 *PLC Control: VAS_Plc.Initial*

[0872] PLC power off; Firmware Major Rev: 9 (P=0x0440003c)
Minor Rev: 16 (S=0x04200036)
Thu Oct 29, 2020 14:32:14.099 *PLC Control: Main2500*

[0871] Ethernet: Link Inactive! (P=0x0e40005c)
Text: Enet Port
Thu Oct 29, 2020 14:32:02.127 *Kernel_AP: FECRstMonitor*

[0869] PLC Starting; Firmware Major Rev: 9 (P=0x0440003a)
Minor Rev: 16 (S=0x04200036)
Release Date: (T=0x04100029)
Text: 9/19/18
Extended Text: Board Serial Number: 000240791
Thu Oct 29, 2020 14:32:00.168 *PLC Control: VAS_Plc.Initial*

[0868] PLC power off; Firmware Major Rev: 9 (P=0x0440003c)
Minor Rev: 16 (S=0x04200036)
Tue Oct 20, 2020 12:33:32.854 *PLC Control: Main2500*

[0867] Ethernet: Link Inactive! (P=0x0e40005c)
Text: Enet Port
Tue Oct 20, 2020 12:32:43.127 *Kernel_AP: FECRstMonitor*

[0865] PLC Starting; Firmware Major Rev: 9 (P=0x0440003a)
Minor Rev: 16 (S=0x04200036)
Release Date: (T=0x04100029)
Text: 9/19/18
Extended Text: Board Serial Number: 000240791
Tue Oct 20, 2020 12:32:41.168 *PLC Control: VAS_Plc.Initial*

RBC Status

Remote Bases Standby RBC Error Counts

Base #	Enabled	Configured	Online	Receive Errors Retries Excluded	Receive Errors Retries Included	Timeout Errors Retries Excluded	Timeout Errors Retries Included
1	Y	N	N	0	0	9678	0
2	Y	N	N	0	0	9678	0
3	Y	N	N	0	0	9678	0
4	Y	N	N	0	0	9678	0
5	Y	N	N	0	0	9678	0
6	Y	N	N	0	0	9677	0
7	Y	N	N	0	0	9677	0
8	Y	N	N	0	0	9677	0
9	Y	N	N	0	0	9677	0
10	Y	N	N	0	0	9677	0
11	Y	N	N	0	0	9677	0
12	Y	N	N	0	0	9677	0
13	Y	N	N	0	0	9677	0
14	Y	N	N	0	0	9677	0
15	Y	N	N	0	0	9677	0
Totals				0	0	145160	0

I/O Statistics

Clear

Clear will zero counts and restart data collection.

```
Last 'Clear' Time:   (not cleared since last PLC startup)
Current Time:        Mon Nov 23, 2020   14:20:22.960
```

Remote Bases Active RBC Error Counts

Base #	Enabled	Configured	Online	Receive Errors Retries Excluded	Receive Errors Retries Included	Timeout Errors Retries Excluded	Timeout Errors Retries Included
1	Y	N	N	0	0	9678	0
2	Y	N	N	0	0	9678	0
3	Y	N	N	0	0	9678	0
4	Y	N	N	0	0	9678	0
5	Y	N	N	0	0	9678	0
6	Y	N	N	0	0	9677	0
7	Y	N	N	0	0	9677	0
8	Y	N	N	0	0	9677	0
9	Y	N	N	0	0	9677	0
10	Y	N	N	0	0	9677	0
11	Y	N	N	0	0	9677	0
12	Y	N	N	0	0	9677	0
13	Y	N	N	0	0	9677	0
14	Y	N	N	0	0	9677	0
15	Y	N	N	0	0	9677	0
Totals				0	0	145160	0

STATUS WORD Memory (viewable from Workshop)

STATUS WORDS are unfamiliar and underutilized by many users. These STATUS WORDS are very powerful assets. Not only does they give you an in-depth access to the heath of your system, but they also allows you access (in your PLC ladder logic program) to monitor their status in real time and be informed immediately (through the programming software or HMI's) of any event you program it to monitor.

Example: Wouldn't you like to know immediately that a remote base has lost communication or that a particular module (anywhere) is offline or not functional?

There are over **500 STATUS WORDS** which are accessible to you, covering things like password, module failure, lost I/O & Profibus network comms, comm port status, f/w versions etc.

Simple PLC logic, monitoring individual STATUS WORDS, is all that is required.

Below is an example of some table of accessible STATUS WORD parameters.

Word	Description
STW 1	**Misc. Status and Non-Fatal Errors**
Bit 1-3	Unused
Bit 4	Password has been entered
Bit 5	Password is currently disabled
Bit 6	User Program Error Flag (RLL). See STW 200 for error code.
Bit 7	RLL Subroutine Stack Overflow
Bit 8	Time of Day Clock Failure
Bit 9	Unused
Bit 10	SF Module Communications Failure
Bit 11	Previous RLL Instruction Failed
Bit 12	I/O Module Failure
Bit 13	Communications Port Failure
Bit 14	Scan Overrun
Bit 15	Battery Low
Bit 16	Source RLL Checksum Error
STW 2	**Base Controller Status** The most significant bit (Bit 1) corresponds to Base 15 and the least significant bit (Bit 16) corresponds to the local base (0) as shown below. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 15 14 13 12 11 10 9 8 7 6 5 4 3 3 1 0 Corresponding bit is set to 1 if : • The base poll flag is not set (polling disabled), or • The base poll flag is set and the base is not present (not online) or is a failed state (unable to log-in).

STW 3 - STW 9	**Status of DP channel slaves.** Set to 0 if slave is online, configured, and enabled. The least significant bit (16) of Word 3 corresponds to Slave #1. See the table below.

Word	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
3	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
4	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
5	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
6	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
7	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65
8	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81
9	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97

STW 10	**Dynamic Scan Time** Scan time of the previous scan.
STW 11: STW 26	**I/O Module Status** STW 11 represents the local base STW 12 – 26 represent remote bases 1 – 15. For all words, the most significant bit (1) represents slot 16 and the least significant bit (16) represents slot 1 as shown below. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 A bit is set to 0 if the module status is good. It is set to 1 if any of the following conditions is true: • Installed module does not match configuration for the slot • The slot is configured but no module is installed in the slot. • The slot is not configured but a module is installed. • Module fail is asserted and module fail bit is set
STW 27: STW 138	**Profibus RBC Module Status.** Provides module status for modules in a 505 base using a Profibus RBC. Status Word 27 corresponds to Profibus RBC slave # 1. Subsequent words correspond to Slave # 2, Slave # 3, etc. For all words, the most significant bit represents slot 16 and the least significant bit (16) represents slot 1 as shown below. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 A bit is set to 0 if the module status is good. It is set to 1 if any of the following conditions is true: • Installed module does not match configuration for the slot • The slot is configured but no module is installed in the slot. • The slot is not configured but a module is installed.
STW 139	**Number of Forced Bits.** Current count of forced X, Y, and C.
STW 140	**Number of Forced Words** Current count of forced WX and WY.

If you require any additional information on WEB Page or STATUS WORD functionality, please contact your local CTI Representative for more information.

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