



Siemens TI305 Series

Overview

Maple Systems' MAP Family & OIT Family Operator Interface Terminals (Maple OITs) communicate with Siemens SIMATIC TI305 Series Programmable Logic Controllers (PLCs) using the CCM (N Sequence) protocol.

Compatible PLCs	
PLC Family	PLC Model
Siemens SIMATIC TI305 Series	TI335, TI330, TI325

Communications Cable

The Maple OIT should be connected to the communication port located on the CPU module of the PLC or through the Data Communications Module (DCU). A Siemens cable assembly (Siemens P/N 2587750-8005) is required for connection of the OIT to the PLC. Refer to Technical Note 1061 for information on communication cable part numbers and cable assembly instructions. If you will be assembling your own communications cable, cable assembly instructions are also available on our web site at www.maple-systems.com.

WARNING: If your communications cable is not wired exactly as shown in our cable assembly instructions, damage to the Maple OIT or loss of communications can result.

PLC Settings

Some versions of the Siemens SIMATIC TI305 PLC have a turnaround delay setting which is set either in the DCU module or in the data register. Because this setting affects communications speed with the OIT, it should always be set to 0.

The Password must match the Password setting in the OITware-200 or MAPware-100.

Accessible PLC Memory

PLC Register Memory

The following table lists the PLC register memory ranges that Maple's OITs are able to access. Please note that your PLC's memory range may be *smaller* or *larger* than that supported by Maple's OITs. The following PLC register memory is displayable in 16-bit or 32-bit formats on the Maple OIT.

PLC Register Address	PLC Register Description
CR 160 to 377, 770 to 777, 1000 to 1067	Internal Control Relays
R 400 to 577, 700 to 777	Data Registers
TMR/CNT 600 to 677	Timer/Counter Accumulator Registers

PLC Discrete Memory

The following table lists the PLC discrete memory ranges that Maple's OITs are able to access. Please note that your PLC's memory range may be *smaller* or *larger* than that supported by Maple's OITs. The following discrete PLC memory is displayable in single-bit and bank formats on the Maple OIT.

PLC Bit Address	PLC Bit Description
I/O 0 to 157, 700 to 767	Discrete Input/Output Coils
SR 400 to 577	Shift Register Bits
T/C 600 to 677	Timer/Counter Bits

OITware-200 Settings

The following table lists the communications settings that must be configured in OITware-200. Please note:

- the Default column lists OITware-200's default setting; your PLC's default may be different
- the Options column lists OITware-200's options; your PLC may not support every option

Name	Default	Options	Important Notes
Baud Rate	9600	19200, 9600, 4800, 2400, 1200, 600, 300	Must match the PLC port settings. Use the fastest baud rate supported by both.
Parity	None	Even, Odd, None, Mark, Space	Must match the PLC port settings.
Data Bits	8	7, 8	Must match the PLC port settings.
Stop Bits	1	1, 2	Must match the PLC port settings.
Status Coils	CR160	CR160 to 377, CR770 to 777, CR1000 to 1067	Must be within the PLC's supported memory range.

Address	1	1 to 90	Must match the PLC port settings.
Source Address, Destination Address	N/A		
Password	Null (Empty)	Four-digit password using numbers 0-9	Must exactly match the access password that is set in the PLC. Otherwise, the Maple OIT will not be able to log on to the PLC.
Message Request Register	R400	R400 to R577	Must be within the PLC's supported memory range.
Current Message Register (optional)	R402	R400 to R577	Must be within the PLC's supported memory range.
Function Key Coils (optional)	CR200	CR160 to 377, CR770 to 777, CR1000 to 1067	Must be within the PLC's supported memory range.
Screen Dependent Function Key Coils (optional)	CR240	CR160 to 377, CR770 to 777, CR1000 to 1067	Must be within the PLC's supported memory range. Applies to OITs with Screen Dependent Function Keys.
Control Key Coils (optional)	CR300	CR160 to 377, CR770 to 777, CR1000 to 1067	Must be within the PLC's supported memory range.
Status LED Coils (optional)	CR160	CR160 to 377, CR770 to 777, CR1000 to 1067	Must be within the PLC's supported memory range. Applies to OITs with Status LEDs.
Function Key LED Coils (optional)	CR220	CR160 to 377, CR770 to 777, CR1000 to 1067	Must be within the PLC's supported memory range. Applies to OITs with Function Key LEDs.

MAPware-100 Settings

The following table lists the communications settings that must be configured in MAPware-100. Please note:

- the Default column lists MAPware-100's default setting; your PLC's default may be different
- the Options column lists MAPware-100's options; your PLC may not support every option

Name	Default	Options	Important Notes
Baud Rate	9600	19200, 9600, 4800, 2400, 1200, 600, 300	Must match the PLC port settings. Use the fastest baud rate supported by both.
Parity	None	Even, Odd, None, Mark, Space	Must match the PLC port settings.

Data Bits	8	7, 8	Must match the PLC port settings.
Stop Bits	1	1, 2	Must match the PLC port settings.
Status Coils	CR160	CR160 to 377, CR770 to 777, CR1000 to 1067	Must be within the PLC's supported memory range.
Address	1	1 to 90	Must match the PLC port settings.
Source Address, Destination Address	N/A		
Password	Null (Empty)	Four-digit password using numbers 0-9	Must exactly match the access password that is set in the PLC. Otherwise, the Maple OIT will not be able to log on to the PLC.
Message Request Register	R400	R400 to R577	Must be within the PLC's supported memory range.
Function Key Coils (optional)	CR200	CR160 to 377, CR770 to 777, CR1000 to 1067	Must be within the PLC's supported memory range.

Important PLC Memory Considerations

If your PLC's memory range is smaller than the range supported by Maple's OITs, it is possible to configure the Maple OIT to monitor a PLC memory address which does not exist. Since this can cause unpredictable results, when you configure the Maple OIT please ensure that all selected PLC memory addresses are valid for your PLC model.

Do not configure the Maple OIT to write to any PLC memory address which should only be written to the PLC.

GE Fanuc Series One Plus

The OIT uses the CCM protocol to communicate with hardware modules of type CCM2 and CCM3. Because of this, the OIT can communicate with the GE Fanuc Series One Plus PLC through the DCU. The DCU must be set to None Parity and Turn Around Delay of 0 sec. It must also be set to ONLINE communications. The GE Fanuc Series One Plus has identical data register and coil format to the Siemens SIMATIC TI305 Series PLCs.

On using Bank 8 or Bank 16 formats

When using these formats, each PLC coil (bit) is individually displayed in terms of 1 and 0, with the lowest addressed coil displayed in the right-most position in the field. Therefore, if using coils I/O 000-017, then I/O 000 is the least significant bit displayed in the right-most position and I/O 017 is the most significant bit displayed in the left-most position. When selecting the address of the register, the address should be on a byte boundary. Since all addresses are expressed in octal, the first coil's address must end in 0 to make a valid bank address. I/O 000-017, CR 160-177, SR460-477 are all examples of valid banks.

Using the Data (R) Registers

The R (data) register addresses are represented using octal notation. Since all R (data) registers are 8-bit registers, the OIT will monitor two successive registers per monitor when a 16-bit format is selected. For example, if R400 is selected, then the OIT will monitor R400 and R401 with R401 being the most significant byte.

NOTE: R777 (available only on the TI335) is used as a turn-around delay time for connections to modems. Inputting a non-zero value in this register will significantly degrade the operation of the OIT.

The OIT uses the password to gain read and write access in the PLC's internal data memory. If no password is entered, the OIT creates a null password of "0000." If this password does not exactly match the access password in the PLC, the OIT will be unable to log on to the PLC. If the password does match, the OIT will unlock the PLC, thus allowing total access to the data and program memory of the PLC until the PLC is repowered.

NOTE: Since this is a password field, a full four-digit number must be entered, including any leading zeroes.

Error Messages

Communication error messages can be displayed on the OIT if a 16-bit register monitor is created to monitor an 8-bit register which is located at the upper range of the PLC's memory map. For example, if data register R777 is monitored by the OIT using a 16-bit register format (Example: Signed), then the OIT will try to read the contents of data register R777 and R778. Since R778 is non-existent, the OIT will generate an error. To monitor R777 as a 16-bit register, R776 should be selected.

Other error messages can be displayed when using a Data Communications Unit (DCU) module that sends an error back to the OIT. Therefore, a malfunctioning DCU or a DCU that has not been configured properly for communications with the OIT may cause errors. For example, the DCU must be in RUN mode or it will not allow access to the memory registers by the OIT.

Memory Conversion Tables for TI325S and TI330S units

The following table allows the user to properly configure the OIT to access data coils used by the Siemens SIMATIC TI325S and the 330S Stage Programmer PLCs that are not used by other versions of the TI Series. Any registers or coils not specifically mentioned are identical. Every eighth coil is specifically referenced, although coils between will also have direct cross references (Example: OIT, CR214 = TI325S, ST014).

OIT	Coil Address	TI 325S, 330S	Coil Address
Control Relay	CR200	Stage Bits	ST 000
Control Relay	CR210	Stage Bits	ST 010
Control Relay	CR220	Stage Bits	ST 020
Control Relay	CR230	Stage Bits	ST 030
Control Relay	CR 240	Stage Bits	ST 040
Control Relay	CR 250	Stage Bits	ST 050

Control Relay	CR 260	Stage Bits	ST 060
Control Relay	CR 270	Stage Bits	ST 070
Control Relay	CR 300	Stage Bits	ST 100
Control Relay	CR310	Stage Bits	ST 110
Control Relay	CR 320	Stage Bits	ST 120
Control Relay	CR 330	Stage Bits	ST 130
Control Relay	CR 340	Stage Bits	ST 140
Control Relay	CR 350	Stage Bits	ST 150
Control Relay	CR 360	Stage Bits	ST 160
Control Relay	CR 370	Stage Bits	ST 170
Shift Register	SR 400	Control Relay	CR 200
Shift Register	SR 410	Control Relay	CR 210
Shift Register	SR 420	Control Relay	CR 220
Shift Register	SR 430	Control Relay	CR 230
Shift Register	SR 440	Control Relay	CR 240
Shift Register	SR 450	Control Relay	CR 250
Shift Register	SR 460	Control Relay	CR 260
Shift Register	SR 470	Control Relay	CR 270
Shift Register	SR 500	Input/Output	IO 700
Shift Register	SR 510	Input/Output	IO 710
Shift Register	SR 520	Input/Output	IO 720
Shift Register	SR 530	Input/Output	IO 730
Shift Register	SR 540	Input/Output	IO 740
Shift Register	SR 550	Input/Output	IO 750
Shift Register	SR 560	Input/Output	IO 760
Shift Register	SR 570	Input/Output	IO 770