



繁體中文

DTC 數位控制器操作手冊

■ 注意事項

⚠ 注意！電擊危險！

- 如果有塵土或金屬殘渣掉入機身，可能會造成誤動作。請勿修改或擅自拆卸本控制器。空餘端子請勿使用。
- 安裝時離開高電壓及具有強高周波雜訊的地方防止干擾。在以下情況會發生的場所避免使用此控制器：
 - 灰塵過多及有腐蝕性氣體
 - 高溼度及高輻射
 - 震動及衝擊
- 上電時請勿接觸機體端子或進行維修，否則可能遭致電擊。
- 切斷電源一分鐘之內，線路未完全放電，請勿接觸內部線路。

■ 型號說明

DTC 1 2 3 4 5

| DTC 系列名稱 | DTC：台達 C 系列數位控制器 |
|------------------------|--|
| 1 機台位置 | 1：第一台 2：並接機種 |
| 2 輔助輸出組數 | 0：標準品 00：標準配備（二組輸出） |
| 3 4 選購配備 | 01：CT 輸入 |
| 5 主輸出型式 | R：繼電器輸出 SPST, 250VAC, 3A V：電壓脈波輸出 12V +10% ~ 20% C：電流輸出 4 ~ 20mA L：線性電壓輸出 0 ~ 10V |

DTC1000/2000：電源為 DC24V 輸入，兩組輸出，第二組輸出為繼電器輸出，RS-485 通訊。
DTC1001/2001：電源為 DC24V 輸入，一組輸出，一組 CT 輸入，RS-485 通訊。

■ 功能及電氣規格

| | |
|--------|---|
| 輸入電源 | 直流電 24V，採隔離式開關電源 |
| 電源消耗功率 | 3W + 3W x DTC2000/2001 並接數（最多可並接 7 台） |
| 輸入感測器 | 熱電偶對：K, J, T, E, N, R, S, B, L, U, TXK 白金測溫電阻：Pt100, JPt100 線性直流輸入：0 ~ 5V, 0 ~ 10V, 0 ~ 20mA, 4 ~ 20mA, 0 ~ 50mV |
| 取樣頻率 | 類比輸入：0.15 秒 熱電偶或白金電阻：0.4 秒 |
| 控制方法 | PID, PID 可編程，手動或 ON/OFF |
| 輸出種類 | 繼電器輸出，單刀單閘，最大負載為交流 250V，3A 的電阻性負載 電壓脈波輸出，直流 12V，最大輸出電流 40mA 電流輸出，直流 4 ~ 20mA 輸出（負載阻抗需小於 500Ω） 類比電壓輸出 0 ~ 10V（負載阻抗需大於 1,000Ω） |
| 操作環境溫度 | 0°C ~ +50°C |
| 操作環境溼度 | 35% ~ 85% RH（無結露） |

■ 產品外觀與各部位名稱

| | |
|----|-----------------------|
| 1 | 執行停止開關 (DTC1000/1001) |
| 2 | 接線圖及名稱 |
| 3 | DIN 軌固定件 |
| 4 | 輸出入端子 |
| 5 | 狀態 LED |
| 6 | 連接固定孔 |
| 7 | 機種標籤 |
| 8 | 擴充連接座 |
| 9 | 擴充固定件 |
| 10 | DIN 軌槽 |
| 11 | RS-485 通訊 |
| 12 | 擴充固定件 |
| 13 | 電源輸入入口 (DTC1000/1001) |

■ RS-485 通訊

接傳輸速度 2,400~38,400bps；不支援 7, N, 1/8, E, 2/8, O, 2 通訊格式；使用 Modbus（ASCII 或 RTU）。通訊協定：功能碼（Function）：03H 讀出暫存器內容,最多 8 個 word。06H 寫入一個 word 至暫存器，01H 讀出位元資料，最多 16 bits。05H 寫入一個 bit 至暫存器。

| 位址 | 預設值 | 名稱 | 說明 |
|-------|-------|-------------------|---|
| 1000H | | PV 目前量測值 | 溫度以 0.1 刻度為計量單位，類比輸入為 1EU。 下列讀值表示錯誤發生： 8002H 輸入讀值尚未取得 8003H 未接感測器 8004H 感測器型式錯誤 8006H 輸入值無法量測,輸入 ADC 錯誤 8007H 記憶體無法讀寫 |
| 1001H | 0 | SV 設定值 | 溫度以 0.1 度為計量單位，類比輸入為 1EU。 |
| 1002H | 6,000 | 輸入偵測範圍最高值 | 超過預設值禁止，溫度以 0.1 度為計量單位 |
| 1003H | -200 | 輸入偵測範圍最低值 | 低於預設值禁止，溫度以 0.1 度為計量單位 |
| 1004H | 12 | 輸入傳感器類型 | 對照值見溫度感測器種類及範圍表 |
| 1005H | 0 | 控制方式 | 0：PID；1：ON/OFF；2：手動；3：PID 程序控制 |
| 1007H | 4 | 第一組控制週期 | 0 ~ 99, 0 代表 0.5 秒 |
| 1008H | 4 | 第二組控制週期 | 0 ~ 99, 0 代表 0.5 秒（二組為相同控制輸出時無效） |
| 1009H | 476 | PB 比例帶設定值 | 1 ~ 9,999，溫度單位為 0.1 度，類比輸入為 1EU |
| 100AH | 260 | Ti 積分控制常數設定值 | 0 ~ 9,999 |
| 100BH | 41 | Td 微分控制常數設定值 | 0 ~ 9,999 |
| 100EH | 100 | 雙輸出時 COEF 的設定 | 1 ~ 9,999，單位為 0.01 |
| 100FH | 0 | 雙輸出時 Dead band 設定 | -999 ~ 9,999，單位為 0.1 度或 1EU |

| 位址 | 預設值 | 名稱 | 說明 |
|-------|-------|-----------------|--|
| 1010H | 0 | 第一組輸出磁滯設定值 | 0 ~ 9,999，單位為 0.1 度或 1EU |
| 1011H | 0 | 第二組輸出磁滯設定值 | 0 ~ 9,999，單位為 0.1 度或 1EU |
| 1012H | 0 | 輸出 1 輸出量讀取及寫入 | 單位為 0.1%，寫入只在手動控制模式下有效 |
| 1013H | 0 | 輸出 2 輸出量讀取及寫入 | 單位為 0.1%，寫入只在手動控制模式下有效 |
| 1014H | 0 | 類比線性輸出上限調整 | 1 刻度 = 2.8μA = 1.3mV |
| 1015H | 0 | 類比線性輸出下限調整 | 1 刻度 = 2.8μA = 1.3mV |
| 1016H | 0 | 溫度誤差調整值 | -999 ~ +999。單位：0.1 度或 1EU |
| 1020H | 0 | 警報 1 輸出模式 | 詳見警報輸出模式選擇 |
| 1021H | 0 | 警報 2 輸出模式 | 詳見警報輸出模式選擇 |
| 1022H | 0 | 自動設定通訊旗標 | 通訊禁止自動設定：0（預設），通訊自動設定：1 |
| 1024H | 40 | 輸出 1 上限警報值 AL1H | 詳見警報輸出說明 |
| 1025H | 40 | 輸出 1 下限警報值 AL1L | 詳見警報輸出說明 |
| 1026H | 40 | 輸出 2 上限警報值 AL2H | 詳見警報輸出說明 (1000/2000) |
| 100 | 100 | CT 警報上限值 | CT 警報下限制 ~ 400, 1 刻度 = 0.1A (1001/2001) |
| 1027H | 40 | 輸出 2 下限警報值 AL2L | 詳見警報輸出說明 (1000/2000) |
| 5 | 5 | CT 警報下限值 | 0 ~ CT 警報上限值, 1 刻度 = 0.1A (1001/2001) |
| 102AH | | 讀寫狀態 | b1: ALM2; b2: °C; b3: °F; b4: ALM1; b5: O2; b6: O1; b7: AT |
| 102BH | | 讀取 CT 測得電流值 | 單位為 0.1A |
| 102CH | 0 | 設定正負比例輸出 | 0：正；1：負 |
| 102EH | | LED 狀態 | b0: RUN; b1: ERR; b2: O2; b3: O1; b4: RX; b5: TX; b6: AT |
| 1037H | 1,000 | 比例輸出上限值 | 0 ~ 100% 類比輸出量的上限值，單位為 0.1% |
| 1038H | 0 | 比例輸出下限值 | 0 ~ 100% 類比輸出量的下限值，單位為 0.1% |
| 1039H | | 讀取 CT 警報狀態 | 0: CT 警報消失, 1: CT 警報動作 |
| 1069H | 0 | 輸出二控制選擇 | 0：加熱；1：冷卻；2：警報；3：比例輸出 |
| 106AH | 0 | 輸出二控制選擇 | 0：加熱；1：冷卻；2：警報 |
| 1071H | 1 | 讀寫通訊位置 | 1 ~ 247 |
| 1072H | 0 | 讀寫通訊格式 | RTU: 1; ASCII: 0 |
| 1073H | 2 | 讀寫通訊速度 | 0 ~ 4; 2,400 ~ 38,400 |
| 1074H | 1 | 讀寫通訊位元長度 | 0: 8bit 1: 7bit |
| 1075H | 1 | 讀寫通訊檢查位元 | 0: None 1: Even 2: Odd |
| 1076H | 1 | 讀寫通訊停止位元 | 0: 2 stop bit 1: 1 stop bit |

位元暫存器位址及內容（讀出位元由 LSB 開始存放，寫入資料為 FF00H 時可將位元值設 '1'。0000H 將位元資料設為 '0'。）

| | | |
|-------|-----------|-----------------------|
| 0811H | 溫度單位顯示選擇 | 0：°F，1：°C（預設） |
| 0813H | 讀寫自動調諧狀態 | 自動調諧停止：0（預設），自動調諧開始：1 |
| 0814H | 控制執行/停止設定 | 0：停止，1：執行（預設） |

■ 通訊協定同步及機器站號自動規劃功能

本功能可將 DTC2000/2001 的機器，設定成與第一台 DTC1000/1001 相同的通訊協定，站號依次遞增。

- 將 DTC1000/1001 的自動通訊設定旗標設為 "1"（通訊位置 1022H）。
- 關機，連接其他 DTC2000/2001 後重新開機即可。
- 出廠預設通訊協定為 9,600bps, 7 bits, Even, 1 stop bit, 通訊位置 01。
- 此功能動作時間機會比正常開機多 3 ~ 5 秒的時間。

■ 輸入功能

| 輸入感測器類型 | 通訊暫存器數值 | 輸入感測器類型 | 通訊暫存器數值 |
|-----------------|---------|-------------|---------|
| 0 ~ 50mV 線性電壓 | 17 | 熱電偶對 L type | 8 |
| 4 ~ 20mA 線性電流 | 16 | 熱電偶對 B type | 7 |
| 0 ~ 20mA 線性電流 | 15 | 熱電偶對 S type | 6 |
| 0 ~ 10V 線性電壓 | 14 | 熱電偶對 R type | 5 |
| 0 ~ 5V 線性電壓 | 13 | 熱電偶對 N type | 4 |
| 白金測溫電阻 (Pt100) | 12 | 熱電偶對 E type | 3 |
| 白金測溫電阻 (JPt100) | 11 | 熱電偶對 T type | 2 |
| 熱電偶對 TXK type | 10 | 熱電偶對 J type | 1 |
| 熱電偶對 U type | 9 | 熱電偶對 K type | 0 |

線性輸入範圍及回傳值範圍可調整，輸入回傳值範圍預設為-999 到 9,999，以 0 ~ 20mA 輸入為例，-999 代表 0mA 輸入，9,999 代表 20mA 輸入。如果更改回傳值範圍為 0 到 2,000，0 代表 0mA 輸入，2,000 代表 20mA 輸入，一個刻度等於 0.01mA。

■ 警報輸出

| 設定值 | 警報種類 |
|-----|---|
| 0 | 無警報功能 |
| 1 | 上下限警報動作：當 PV 值超過 SV+AL-H 或低於 SV-AL-L 的值得時，對應警報動作。 |
| 2 | 上限警報動作：當 PV 值超過 SV+AL-H 的值得時，對應警報動作。 |
| 3 | 下限警報動作：當 PV 值低於 SV-AL-L 的值得時，對應警報動作。 |
| 4 | 上下限警報逆動作：當 PV 值在 SV+AL-H 與 SV-AL-L 之間時，對應警報動作。 |
| 5 | 絕對值上下限警報動作：當 PV 值超過 AL-H 或低於 AL-L 的值得時，對應警報動作。 |
| 6 | 絕對值上限警報動作：當 PV 值超過 AL-H 的值得時，對應警報動作。 |
| 7 | 絕對值下限警報動作：當 PV 值低於 AL-L 的值得時，對應警報動作。 |
| 8 | 待機上下限警報動作：當 PV 值到達設定值後，溫度超過 SV+AL-H 或低於 SV-AL-L 的值得時，對應警報動作。 |
| 9 | 待機上限警報動作：當 PV 值到達設定值後，溫度超過 SV+AL-H 的值得時，對應警報動作。 |
| 10 | 待機下限警報動作：當 PV 值到達設定值後，溫度低於 SV-AL-L 的值得時，對應警報動作。 |
| 11 | 遲滯上限警報動作：當 PV 值超過於 SV+AL-H 的值得時，對應警報動作。當 PV 值低於 SV+AL-L 時，對應警報消失。 |
| 12 | 遲滯下限警報動作：當 PV 值低於 SV-AL-H 的值得時，對應警報動作。當 PV 值高於 SV-AL-L 時，對應警報消失。 |
| 13 | 設定為 CT 功能：當 CT 值低於 CT 警報下限值時，對應警報動作。當 CT 值高於 CT 警報上限值時，對應警報動作。 |

■ 如何設定電流輸入

電流輸入已內建 249Ω 精密電阻

| 一般輸入（出廠預設） | 電流輸入（4 ~ 20mA, 0 ~ 20mA） |
|-----------------|--------------------------|
| | |
| DEFAULT SETTING | |

更多詳細操作資料，請至台灣網站下載 www.delta.com.tw/industrialautomation

DTC 數字控制器操作手冊

■ 注意事項

⚠ 注意！電擊危險！

- 如果有塵土或金屬殘渣掉入機身，可能會造成誤運行。請勿修改或擅自拆卸本控制器。空余端子請勿使用。
- 安裝時離開高電壓及具有強高周波噪音的地方防止干擾。在会发生以下情况的场所避免使用此控制器：
 - 灰尘过多及有腐蚀性气体
 - 高湿度及高辐射
 - 震动及冲击
- 上电时请勿接触机体端子或进行维修，否则可能遭致电击。
- 切断电源一分钟之内，线路未完全放电，请勿接触内部线路。

■ 型號說明

DTC 1 2 3 4 5

| DTC 系列名称 | DTC：台达 C 系列数字控制器 |
|------------------------|--|
| 1 机台位置 | 1：第一台 2：并接机种 |
| 2 辅助输出组数 | 0：标准品 00：标准配备（二组输出） |
| 3 4 选购配备 | 01：CT 输入 |
| 5 主输出型式 | R：继电器输出 SPST, 250VAC, 3A V：电压脉冲输出 12V +10% ~ 20% C：电流输出 4 ~ 20mA L：线性电压输出 0 ~ 10V |

DTC1000/2000：電源為 DC24V 輸入，兩組輸出，第二組輸出為繼電器輸出，RS-485 通訊。
DTC1001/2001：電源為 DC24V 輸入，一組輸出，一組 CT 輸入，RS-485 通訊。

■ 功能與電氣規格

| | |
|--------|---|
| 輸入電源 | 直流電 24V，採隔離式開關電源 |
| 電源消耗功率 | 3W + 3W x DTC2000/2001 並接數（最多可並接 7 台） |
| 輸入傳感器 | 熱電偶對：K, J, T, E, N, R, S, B, L, U, TXK 白金測溫電阻：Pt100, JPt100 線性直流輸入：0 ~ 5V, 0 ~ 10V, 0 ~ 20mA, 4 ~ 20mA, 0 ~ 50mV |
| 取樣頻率 | 模擬輸入：0.15 秒 熱電偶或白金電阻：0.4 秒 |
| 控制方法 | PID, PID 可編程，手動或 ON/OFF |
| 輸出種類 | 繼電器輸出，單刀單閘，最大負載為交流 250V，3A 的電阻性負載 電壓脈波輸出，直流 12V，最大輸出電流 40mA 電流輸出，直流 4 ~ 20mA 輸出（負載阻抗需小於 500Ω） 模擬電壓輸出 0 ~ 10V（負載阻抗需大於 1,000Ω） |
| 操作環境溫度 | 0°C ~ +50°C |
| 操作環境溼度 | 35% ~to 85% RH（無結露） |

■ 產品外觀與各部位名稱

| | |
|----|--------------------------|
| 1 | 執行停止開關 (DTC1000/1001) |
| 2 | 接線圖及名稱 |
| 3 | DIN 軌固定件 |
| 4 | 輸出入端子 |
| 5 | 狀態 LED |
| 6 | 連接固定孔 |
| 7 | 機種標籤 |
| 8 | 擴充連接座 |
| 9 | 擴充固定件 |
| 10 | DIN 軌槽 |
| 11 | RS-485 通訊 (DTC1000/1001) |
| 12 | 擴充固定件 |
| 13 | 電源輸入入口 (DTC1000/1001) |

■ RS-485 通訊

支持傳輸速度 2,400~38,400bps；不支援 7, N, 1/8, E, 2/8, O, 2 通訊格式；使用 Modbus（ASCII 或 RTU）通信協議；功能碼（Function）：03H 讀出緩存器內容,最多 8 個 word。06H 寫入一個 word 至寄存器，01H 讀出位數據，最多 16 bits。05H 寫入一個 Bit 至寄存器。

| 地址 | 默認值 | 名稱 | 說明 |
|-------|-------|-------------------|--|
| 1000H | | PV 目前測量值 | 溫度以 0.1 刻度為計量單位，模擬輸入為 1EU。 下列讀值表示錯誤發生： 8002H 輸入讀值尚未取得 8003H 未接傳感器 8004H 傳感器型式錯誤 8006H 輸入值無法測量,輸入 ADC 錯誤 8007H 內存無法讀寫 |
| 1001H | 0 | SV 設定值 | 溫度以 0.1 度為計量單位，模擬輸入為 1EU。 |
| 1002H | 6,000 | 輸入偵測範圍最高值 | 超過預設值禁止，溫度以 0.1 度為計量單位 |
| 1003H | -200 | 輸入偵測範圍最低值 | 低於預設值禁止，溫度以 0.1 度為計量單位 |
| 1004H | 12 | 輸入傳感器類型 | 對照值見溫度傳感器種類與範圍表 |
| 1005H | 0 | 控制方式 | 0：PID；1：ON/OFF；2：手動；3：PID 過程控制 |
| 1007H | 4 | 第一組控制週期 | 0 ~ 99, 0 代表 0.5 秒 |
| 1008H | 4 | 第二組控制週期 | 0 ~ 99, 0 代表 0.5 秒（二組為相同控制輸出時無效） |
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| 100BH | 41 | Td 微分控制常數設定值 | 0 ~ 9,999 |
| 100EH | 100 | 雙輸出時 COEF 的設定 | 1 ~ 9,999，單位為 0.01 |
| 100FH | 0 | 雙輸出時 Dead band 設定 | -999 ~ 9,999，單位為 0.1 度或 1EU |
| 1010H | 0 | 第一組輸出磁滯設定值 | 0 ~ 9,999，單位為 0.1 度或 1EU |
| 1011H | 0 | 第二組輸出磁滯設定值 | 0 ~ 9,999，單位為 0.1 度或 1EU |
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| 1013H | 0 | 輸出 2 輸出量讀取與寫入 | 單位為 0.1%，寫入只在手動控制模式下有效 |

| 地址 | 默認值 | 名稱 | 說明 |
|-------|-------|-----------------|--|
| 1014H | 0 | 模擬线性输出上限调整 | 1 刻度 = 2.8μA = 1.3mV |
| 1015H | 0 | 模拟线性输出下限调整 | 1 刻度 = 2.8μA = 1.3mV |
| 1016H | 0 | 温度误差调整值 | -999 ~ +999。单位：0.1 度或 1EU |
| 1020H | 0 | 警報 1 輸出模式 | 詳見警報輸出模式選擇 |
| 1021H | 0 | 警報 2 輸出模式 | 詳見警報輸出模式選擇 |
| 1022H | 0 | 自動設定通訊旗標 | 通訊禁止自動設定：0（預設），通訊自動設定：1 |
| 1024H | 40 | 輸出 1 上限警報值 AL1H | 詳見警報輸出說明 |
| 1025H | 40 | 輸出 1 下限警報值 AL1L | 詳見警報輸出說明 |
| 1026H | 40 | 輸出 2 上限警報值 AL2H | 詳見警報輸出說明 |
| 100 | 100 | CT 警報上限值 | CT 警報上限制 ~ 400, 1 刻度 = 0.1A |
| 1027H | 40 | 輸出 2 下限警報值 AL2L | 詳見警報輸出說明 |
| 5 | 5 | CT 警報下限值 | 0 ~ CT 警報上限值, 1 刻度 = 0.1A |
| 102AH | | 讀寫狀態 | b1: ALM2; b2: °C; b3: °F; b4: ALM1; b5: O2; b6: O1; b7: AT |
| 102BH | | 讀取 CT 測得電流值 | 單位為 0.1A |
| 102CH | 0 | 設定正負比例輸出 | 0：正；1：負 |
| 102EH | | LED 狀態 | b0: RUN; b1: ERR; b2: O2; b3: O1; b4: RX; b5: TX; b6: AT |
| 1037H | 1,000 | 比例輸出上限值 | 0 ~ 100% 模拟输出量的上限值，单位为 0.1% |
| 1038H | 0 | 比例輸出下限值 | 0 ~ 100% 模拟输出量的下限值，单位为 0.1% |
| 1039H | | 讀取 CT 警報狀態 | 0: CT 警報消失, 1: CT 警報動作 |
| 1069H | 0 | 輸出二控制選擇 | 0：加熱；1：冷卻；2：警報；3：比例輸出 |
| 106AH | 0 | 輸出二控制選擇 | 0：加熱；1：冷卻；2：警報 |
| 1071H | 1 | 讀寫通訊位置 | 1 ~ 247 |
| 1072H | 0 | 讀寫通訊格式 | RTU: 1; ASCII: 0 |
| 1073H | 2 | 讀寫通訊速度 | 0 ~ 4; 2,400 ~ 38,400 |
| 1074H | 1 | 讀寫通訊位長度 | 0: 8bit 1: 7bit |
| 1075H | 1 | 讀寫通訊校驗位 | 0: |

DTC Series Temperature Controller

Caution

⚠ DANGER! Caution! Electric Shock!

- Prevent dust or metallic debris from falling into the controller that will cause malfunction. DO NOT modify or disassemble the controller. DO NOT use extra terminals.
- Do not install and/or use the controller in places subject to:
 - dust or corrosive gases and liquid
 - high humidity and high radiation
 - vibration and shock
- DO NOT touch the terminals or repair the controller when the power is on to prevent electric shock.
- Wait at least one minute after the power is off to allow the capacitor to discharge. DO NOT touch any internal circuit within this period.

Ordering Information

| Series name | DTC: Delta C series temperature controller |
|----------------------------------|---|
| 1 Controller position | 1: First controller 2: Controller connected in parallel |
| 2 Auxiliary output groups | 0: standard |
| 3 4 Optional | 00: Standard 01: CT input R: Relay output SPST, 250VAC, 3A V: Voltage pulse output 12V +10% ~ -20% C: Current output 4 ~ 20mA L: Linear voltage output 0 ~ 10V |
| 5 Main output type | |

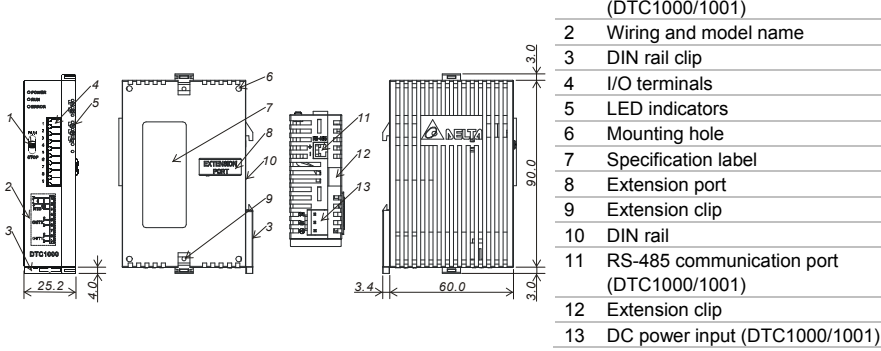
DTC1000/2000: DC24V input, 2 outputs, relay output for output 2, RS-485 communication.

DTC1001/2001: DC24V input, 1 output, 1 CT input, and RS-485 communication.

Function & Specification

| | |
|---------------------|---|
| Power supply | DC24V. Isolated switching power |
| Power consumption | Rated 24 VDC, Max. 24 W combined, 3W + 3W x number of DTC2000/2001 controllers (Max. 7) |
| Input sensors | Thermocouple: K, J, T, E, N, R, S, B, L, U, TXK Platinum RTD: Pt100, JPt100 Linear DC input: 0 ~ 5V, 0 ~ 10V, 0 ~ 20mA, 4 ~ 20mA, 0 ~ 50mV |
| Sampling rate | Analog input: 0.15 sec. Thermocouple or platinum RTD: 0.4 sec. |
| Control method | PID, programmable PID, Manual, ON/OFF Relay: SPST, Max. load 250VAC, 3A resistive load Voltage pulse: 12VDC, Max. output current: 40mA Current: DC 4 ~ 20mA (Load resistance: < 500Ω) Analog voltage: 0 ~ 10V (Load resistance: > 1,000Ω) |
| Output types | |
| Ambient temperature | 0 ~ 50 C |
| Ambient humidity | 35% ~ 85% RH (non-condensing) |
| Pollution degree | 2 |

Product Profile & Outline



RS-485 Communication

- Supports transmission speed: 2,400, 4,800, 9,600, 19,200, 38,400bps;
- Does not support 7, N, 1 / 8, E, 2 / 8, O, 2 communication format;
- Communication protocol: Modbus ASCII/RTU;
- Function code: 03H (read Max. 8 words in register), 06H (write 1 word into register), 01H (read Max. 16 bits of data), 05H (write 1 bit into register).

| Address | Setting | Content | Explanation |
|---------|---------|---|---|
| 1000H | | Present temperature value (PV) | Unit: 0.1 degree. Analog input: 1EU. The read values below indicate occurrence of errors: 8002H: Temperature not acquired yet 8003H: Temperature sensor not connected 8004H: Incorrect sensor type 8006H: Unable to acquire temperature, ADC input error 8007H: Unable to read/write the memory |
| 1001H | 0 | Set point (SV) | Unit: 0.1 degree. Analog input: 1EU. |
| 1002H | 6,000 | Upper-limit of temperature range | The content shall not be bigger than the range. Unit:0.1° |
| 1003H | -200 | Lower-limit of temperature range | The content shall not be smaller than the range. Unit: 0.1° |
| 1004H | 12 | Input sensor type | See the table in "Input" section. |
| 1005H | 0 | Control method | 0: PID, 1: ON/OFF, 2: Manual, 3: programmable PID |
| 1007H | 4 | Control cycle of Output 1 | 0 ~ 99, 0: 0.5sec |
| 1008H | 4 | Control cycle of Output 2 | 0 ~ 99, 0: 0.5sec (Invalid when the 2 outputs are the same control.) |
| 1009H | 476 | Proportional band value | 1 ~ 9,999, Unit: 0.1°. Analog input: 1EU |
| 100AH | 260 | Ti value | 0 ~ 9,999 |
| 100BH | 41 | Td value | 0 ~ 9,999 |
| 100EH | 100 | COEF setting when in dual control output | 1 ~ 9,999, Unit: 0.01 |
| 100FH | 0 | Deadband setting when in dual control output | -999 ~ 9,999, Unit: 0.1° or 1EU |
| 1010H | 0 | Hysteresis of Output 1 | 0 ~ 9,999, Unit: 0.1° or 1EU |
| 1011H | 0 | Hysteresis of Output 2 | 0 ~ 9,999, Unit: 0.1° or 1EU |
| 1012H | 0 | Read/write output percentage of Output 1 | Unit: 0.1%. "Write" is only applicable in manual mode. |
| 1013H | 0 | Read/write output percentage of Output 2 | Unit: 0.1%. "Write" is only applicable in manual mode. |
| 1014H | 0 | Upper-limit regulation for analog linear output | 1 scale = 2.8 μA = 1.3mV |
| 1015H | 0 | Lower-limit regulation for analog linear output | 1 scale = 2.8 μA = 1.3mV |
| 1016H | 0 | Temperature offset | -999 ~ +999, Unit: 0.1° or 1EU |

| Address | Setting | Content | Explanation |
|---------|---------|---------------------------------------|--|
| 1020H | 0 | regulation value | |
| 1021H | 0 | Output mode for Alarm 1 | See "Alarm Output" section. |
| 1022H | 0 | Output mode for Alarm 2 | See "Alarm Output" section. |
| 1022H | 0 | Communication flag auto-set | 0: Communication banned, 1: Communication auto-set |
| 1024H | 40 | Upper limit for Alarm 1 | See "Alarm Output" section. |
| 1025H | 40 | Lower limit for Alarm 1 | See "Alarm Output" section. |
| 1026H | 40 | Upper limit for Alarm 2 | See "Alarm Output" section. |
| 1026H | 100 | Upper limit for CT alarm | CT alarm lower limit ~ 400, 1 scale = 0.1A |
| 1027H | 40 | Lower limit for Alarm 2 | See "Alarm Output" section. |
| 1027H | 5 | Lower limit for CT alarm | 0 ~ CT alarm upper limit, 1 scale = 0.1A |
| 102AH | | Read/write status | b1: ALM2, b2°C, b3:°F, b4:ALM1, b5:O2, b6:O1, b7:AT |
| 102BH | | Read current detected by CT | Unit: 0.1A |
| 102CH | 0 | Positive/negative proportional output | 0: positive, 1: negative |
| 102EH | | LED status | b0:RUN, b1:ERR, b2:O2, b3:O1, b4:RX, b5:TX, b6:AT |
| 1037H | 1,000 | Upper limit of proportional output | 0 ~ 100% upper limit of analog output, Unit: 0.1% |
| 1038H | 0 | Lower limit of proportional output | 0 ~ 100% lower limit of analog output, Unit: 0.1% |
| 1039H | | CT Alarm status | 0: Disabled, 1: Enabled |
| 1069H | 0 | Control selection of Output 1 | 0: Heating, 1: Cooling, 2: Alarm, 3: Proportional output |
| 106AH | 0 | Control selection of Output 2 | 0: Heating, 1: Cooling, 2: Alarm |
| 1071H | 1 | Read/write communication address | 1 ~ 247 |
| 1072H | 0 | Read/write communication format | 1: RTU, 0: ASCII |
| 1073H | 2 | Read/write communication speed | 0 ~ 4: 2,400 ~ 38,400 |
| 1074H | 1 | Read/write communication data length | 0: 8 bits, 1: 7 bits |
| 1075H | 1 | Read/write parity bit | 0: None, 1: Even, 2: Odd |
| 1076H | 1 | Read/write stop bit | 0: 2 stop bits, 1: 1 stop bit |

Address and content of the bit register (read bits are stored starting from LSB, and written data is FF00H, set the bit as 1. 0000H sets the bits data to "0").

| | | |
|-------|-------------------------------|----------------------------|
| 0811H | Temperature unit display | 0:°F, 1:°C (Default) |
| 0813H | Read/write auto-tuning status | 0: End (Default), 1: Start |
| 0814H | Run/Stop setting | 0: Stop, 1: Run (Default) |

Synchronous Communication Protocol & Auto ID Setup

This function allows the user to set the communication protocol of DTC2000/2001 to the same protocol as set in the first DTC1000/1001. The station IDs of DTC are arranged in decreasing order. Follow the steps below.

- Set the auto communication ID of DTC1000/1001 to "1" (communication address: 1022H).
- Switch off DTC1000/1001 before connecting it to DTC2000/2001. Switch it on again.
- Default communication protocol: 9,600bps, 7 bits, Even, 1 stop bit, communication address 01.
- This function will consume 3 ~ 5 seconds more when you switch on your DTC.

Input

| Input Sensor | Register Value | Input Sensor | Register Value |
|-------------------------------|----------------|---------------------|----------------|
| 0 ~ 50mV linear voltage input | 17 | Thermocouple L type | 8 |
| 4 ~ 20mA linear current input | 16 | Thermocouple B type | 7 |
| 0 ~ 20mA linear current input | 15 | Thermocouple S type | 6 |
| 0 ~ 10V linear voltage input | 14 | Thermocouple R type | 5 |
| 0 ~ 5V linear voltage input | 13 | Thermocouple N type | 4 |
| Platinum RTD (Pt100) | 12 | Thermocouple E type | 3 |
| Platinum RTD (JPt100) | 11 | Thermocouple T type | 2 |
| Thermocouple TXK type | 10 | Thermocouple J type | 1 |
| Thermocouple U type | 9 | Thermocouple K type | 0 |

The range of linear input and feedback value is adjustable. Range of input feedback: -999 ~ 9,999. Take 0 ~ 20mA input as example. -999 refers to 0mA input, and 9,999 refers to 20mA input. If we change the range to 0 ~ 2,000, 0 will refer to 0mA input, and 2,000 will refer to 20mA input. 1 display scale = 0.01mA.

Alarm Output

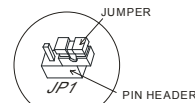
| Mode | Alarm Type |
|------|--|
| 0 | No alarm |
| 1 | Alarm output will be enabled when the temperature reaches upper and lower limits. • Alarm will be enabled when the PV exceeds SV + AL-H or falls below SV - AL-L. |
| 2 | Alarm output will be enabled when the temperature reaches the upper limit. • Alarm will be enabled when the PV exceeds SV + AL-H. |
| 3 | Alarm output will be enabled when the temperature reaches the lower limit. • Alarm will be enabled when the PV falls below SV - AL-L. |
| 4 | • Alarm will be enabled when the PV is between SV + AL-L and SV - AL-L. |
| 5 | Alarm output will be enabled when the temperature reaches the absolute value of the upper and lower limits. • Alarm will be enabled when the PV exceeds AL-H or falls below AL-L. |
| 6 | Alarm output will be enabled when the temperature reaches the absolute value of the upper limit. • Alarm will be enabled when the PV exceeds AL-H. |
| 7 | Alarm output will be enabled when the temperature reaches the absolute value of the lower limit. • Alarm will be enabled when the PV falls below AL-L. |
| 8 | Standby upper/lower limit alarm • Alarm will be enabled when the PV reaches SV and exceeds SV + AL-H or falls below SV - AL-L. |
| 9 | Upper limit standby alarm • Alarm will be enabled when the PV reaches SV and exceeds SV + AL-H. |
| 10 | Lower limit standby alarm • Alarm will be enabled when the PV reaches SV and falls below SV - AL-L. |
| 11 | Upper limit hysteresis alarm • Alarm will be enabled when the PV exceeds SV + AL-H and disabled when the PV falls below SV+ AL-L. |
| 12 | Lower limit hysteresis alarm • Alarm will be enabled when the PV falls below SV - AL-H and disabled when the PV exceeds SV - AL-L. |
| 13 | CT alarm output: • This alarm operates when the current measured by transformer (CT) is lower than AL-L or higher than AL-H |

How to Set Up Current Input

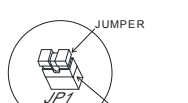
The current input is built-in with 249Ω precision resistor.

For general input

For current input (4 ~ 20mA, 0 ~ 20mA)



DEFAULT SETTING



DEFAULT SETTING

Download detailed operation instruction from Delta's website www.delta.com.tw/industrialautomation

DTC Serisi Proses Kontrol Cihazı

Uyarılar

⚠ Tehlike! Elektrik Şoku!

- Cihazın arızalanmasını önlemek için, içine toz ve yabancı maddeler düşürmemeye özen gösterin.
- "No used" terminallerine kesinlikle bağlantı yapmayın.
- Kontrol cihazını aşağıdaki şartlarda kurmayın veya çalıştırmayın:
 - Toz veya aşındırıcı gaz ve sıvı
 - Yüksek rutubet ve yüksek radyasyon
 - Titreşim ve sok
- Elektrik şoku önlemek için cihaz enerjili iken terminallere dokunmayın veya taktir etmeye çalışmayın.
- Enerji kesildiikten sonra kapasitörlerin deşarj olması için en az 1 dakika bekleyin ve bu süre içinde kesinlikle kontrol cihazının terminallerine dokunmayın.

Sipariş Bilgisi

| DTC Serisi | DTC: Delta C serisi Proses Kontrol Cihazı |
|-----------------------------------|---|
| 1 Kontrol Cihazı Pozisyonu | 1: ana ünite 2: ilave ünite |
| 2 Yardımcı Çıkış Grupları | 0: standard |
| 3 4 Opsiyonel | 00: standard 01: CT girişi |
| 5 Ana Çıkış Tipi | R: Röle çıkışı SPST, 250VAC, 3A V: Voltaj Pulse çıkışı 12V +10% ~ -20% C: Akım çıkışı 4 ~ 20mA L: Lineer Voltaj çıkışı 0 ~ 10V |

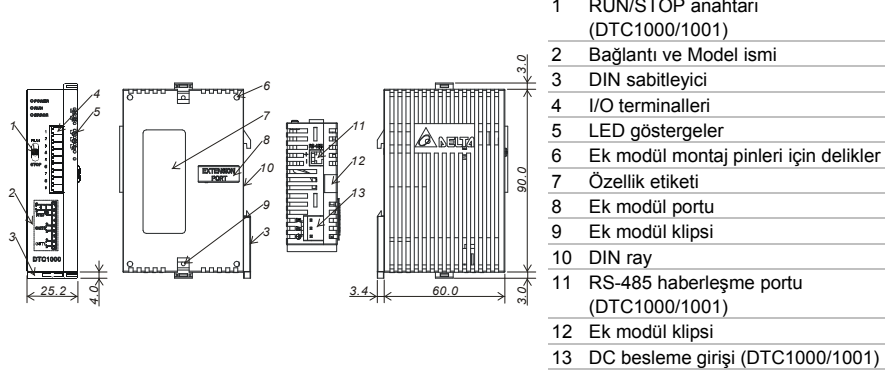
DTC1000/2000: DC24V giriş, 2. grup için röle çıkışı, RS-485 haberleşme.

DTC1001/2001: DC24V giriş, 1 çıkış, 1 CT giriş, ve RS-485 haberleşme.

Fonksiyon & Özellikler

| | |
|-------------------|---|
| Güç Kaynağı | DC24V. İzoleli anahtarlamalı güç kaynağı |
| Güç Tüketimi | 24 Vdc, Max. 24 W birleşik, 3 W + 3 W x her bir DTC2000/2001 (max. 7 ünite) Termokupl: K, J, T, E, N, R, S, B, L, U, TXK |
| Sensör tipi | Platinyum RTD: Pt100, JPt100 Lineer DC input: 0~5V,0~10V, 0~ 20 mA,4~20 mA, 0~50mV |
| Örnekleme hızı | Analog input: 0.15 sn. Termokupl veya Platinyum RTD: 0.4 sn. |
| Kontrol metodu | PID, PID program kontrol, Manuel veya ON/OFF Röle çıkışı (SPST), Max. yük 250VAC, 3A rezistif yük Voltaj pulse çıkışı: DC 14V, Max. çıkış akımı 40mA Akım çıkışı: DC 4 ~ 20mA çıkışı (Yük direnci: Max. 500Ω) Analog voltaj çıkışı: 0~10V (Yük direnci 1000Ω üzerinde olacak) |
| Çıkış tipi | |
| Çalışma Sıcaklığı | 0°C ~ + 50°C |
| Bağıl nem | 35% ~ 85% RH (yoğunlaşmasız ortam) |
| Kirlilik derecesi | 2.derece |

Ürün Profili & Dış Görünüm



RS-485 Haberleşme

- Desteklenen iletişim hızları: 2,400, 4,800, 9,600, 19,200, 38,400bps.
- Desteklenmeyen formatlar: 7, N, 1 yada 8, E, 2 yada 8, O, 2.
- Haberleşme protokolü: Modbus (ASCII yada RTU)
- Fonksiyon kodu: 03H register içeriğini okuma (max. 8 word). 06H registre bir word yazma. 01H data bitlerini okuma (max. 16 bit). 05H registre bir bit yazma.

| Adres | Değeri | İçerdiği | Açıklama |
|-------|--------|--|---|
| 1000H | | Mevcut değer (PV) | Aşağıdaki okuma değerleri hata durumunu gösterir: 8002H : Dahili proses (Sıcaklık değeri henüz alınmadı) 8003H : Sıcaklık sensörü bağlı değil 8004H : Sıcaklık sensörü girişi hatası 8006H : Sıcaklık değeri alınamıyor, ADC girişi hatası 8007H : Memory okuma/yazma hatası |
| 1001H | 0 | Set değeri (SV) | Birim: 0.1 derece. Analog input: 1EU. |
| 1002H | 6,000 | Sıcaklık aralığı üst-limiti | Üst-limit sınırlama, birim: 0.1 derece. |
| 1003H | -200 | Sıcaklık aralığı alt-limiti | Alt-limit sınırlama, birim: 0.1 derece. |
| 1004H | 12 | Giriş sıcaklık sensörü tipi | Detaylı bilgi için lütfen "Sıcaklık Sensör Tipi ve Sıcaklık Aralığı" bölümüne bakınız |
| 1005H | 0 | Kontrol metodu | 0: PID, 1: ON/OFF, 2: manual tuning, 3: PID program kontrol. |
| 1007H | 4 | Isıtma/Soğutma kontrol saykılı (1. çıkış grubu için) | 0~99, 0:0.5 sn |
| 1008H | 4 | Isıtma/Soğutma kontrol saykılı (2. çıkış grubu için) | 0~99, 0:0.5 sn (her iki grup aynı anda kontrol çıkışı verirse bu ayar geçersiz olur) |
| 1009H | 476 | PB Proportional band | 1 ~ 9999, birim: 0.1 derece, analog input: 1EU |
| 100AH | 260 | Ti Integral zamanı | 0~9999 |
| 100BH | 41 | Td Derivative zamanı | 0~9999 |
| 100EH | 100 | Dual Loop çıkış kontrolde COEF katsayısı | 1 ~ 9999, birim: 0.01 |
| 100FH | 0 | Dual Loop çıkış kontrolde Dead Band(ölü bant) ayarı | -999~9999, birim: 0.1 derece veya 1EU |
| 1010H | 0 | 1. çıkış grubunun histeresis ayarı | 0~9999, birim: 0.1 derece veya 1EU |
| 1011H | 0 | 1. çıkış grubunun histeresis ayarı | 0~9999, birim: 0.1 derece veya 1EU |
| 1012H | 0 | 1. çıkış okuma ve yazma değeri | birim: 0.1%, yazma sadece manuel modda yapılabilir |
| 1013H | 0 | 1. çıkış okuma ve yazma değeri | birim: 0.1%, yazma sadece manuel modda yapılabilir |
| 1014H | 0 | Analog lineer çıkış üst-limit ayarı | 1 scale=2.8μA=1.3mV |

| Adres | Değeri | İçeriği | Açıklama |
|-------|--------|-------------------------------------|--|
| 1015H | 0 | Analog lineer çıkış alt-limit ayarı | 1 scale=2.8μA=1.3mV |
| 1016H | 0 | Sıcaklık düzenleme değeri | -999~+999, birim: 0.1 derece veya 1EU |
| 1020H | 0 | Alarm 1 tipi | Detaylı bilgi için "Alarm Çıkışları" bölümüne bakınız. |
| 1021H | 0 | Alarm 2 tipi | Detaylı bilgi için "Alarm Çıkışları" bölümüne bakınız. |
| 1022H | 0 | Otomatik haberleşme ayarı | Haberleşme otomatik ayarlanamaz: 0, haberleşme otomatik ayarlanır: 1 |
| 1024H | 40 | Alarm 1 üst-limiti : AL1H | Detaylı bilgi için "Alarm Çıkışları" bölümüne bakınız. |
| 1025H | 40 | Alarm 1 alt-limiti : AL1L | Detaylı bilgi için "Alarm Çıkışları" bölümüne bakınız. |
| 1026H | 40 | Alarm 2 üst-limiti : AL2H | Detaylı bilgi için "Alarm Çıkışları" bölümüne bakınız. |
| 1026H | 100 | CT Alarm için Üst Limit | CT alarm alt limit ~ 400 arası, 1 birim = 0.1A |
| 1027H | 40 | Alarm 2 alt-limiti : AL2L | Detaylı bilgi için "Alarm Çıkışları" bölümüne bakınız. |
| 1027H | 5 | CT Alarm için Alt Limit | 0 ~ CT alarm üst limit arası, 1 birim = 0.1A |
| 102AH | | Okuma/Yazma durumu | b1:ALM2, b2:°C, b3:°F, b4: ALM1, b5: O2, b6:O1, b7: AT |
| 102BH | | CT ile algılanan akımı okuma | Birim: 0.1A |
| 102CH | 0 | Pozitif/Negatif oransal çıkış ayarı | 0: pozitif, 1: negatif |
| 102EH | | LED durumu | b0: RUN,b1: ERR, b2: O2, b3: O1,b4: RX,b5:TX b6: AT |
| 1037H | 1,000 | Oransal çıkışın üst-limiti | Max. analog çıkışa göre 0~100% , birim: 0.1% |
| 1038H | 0 | Oransal çıkışın alt-limiti | Max. analog çıkışa göre 0~100% , birim: 0.1% |
| 1039H | | CT Alarm durumu | 0: Pasif, 1: Aktif |
| 1069H | 0 | Çıkış 1: kontrol seçimi | 0: ısıtma, 1: soğutma, 2: alarm, 3: oransal çıkış |
| 106AH | 0 | Çıkış 2: kontrol seçimi | 0: ısıtma, 1: soğutma, 2: alarm |
| 1071H | 1 | Okuma/Yazma haberleşme adresi | 1~247 |
| 1072H | 0 | Okuma/Yazma haberleşme formatı | RTU:1, ASCII:0 |
| 1073H | 2 | Haberleşme baud rate ayarı | 0~4: 2400~38400 |
| 1074H | 1 | Haberleşme data uzunluğu | 0:8bit 1: 7bit |
| 1075H | 1 | Eşlik biti ayarı | 0: None 1:Even 2: Odd |
| 1076H | 1 | Stop bit ayarı | 0: 2 stop bit 1: 1 stop bit |