ET-MINI CNT6

ET-MINI CNT6 is a mini Digital Programmable Counter; it has 7-Segment Display in numeric values with 0.56 inch height, 7-Digit, and 3-Row. It can count and remember the counting, and it can calculate the different values of counting by self. It supports the counting values in the range of +/-999,999. There is 3-CH Signal Input to control the counting; count-up, count-down and reset the counting; and there is 1-CH Signal Output as Contact Relay (COMMON, NO, NC) to give a warning (ALARM).
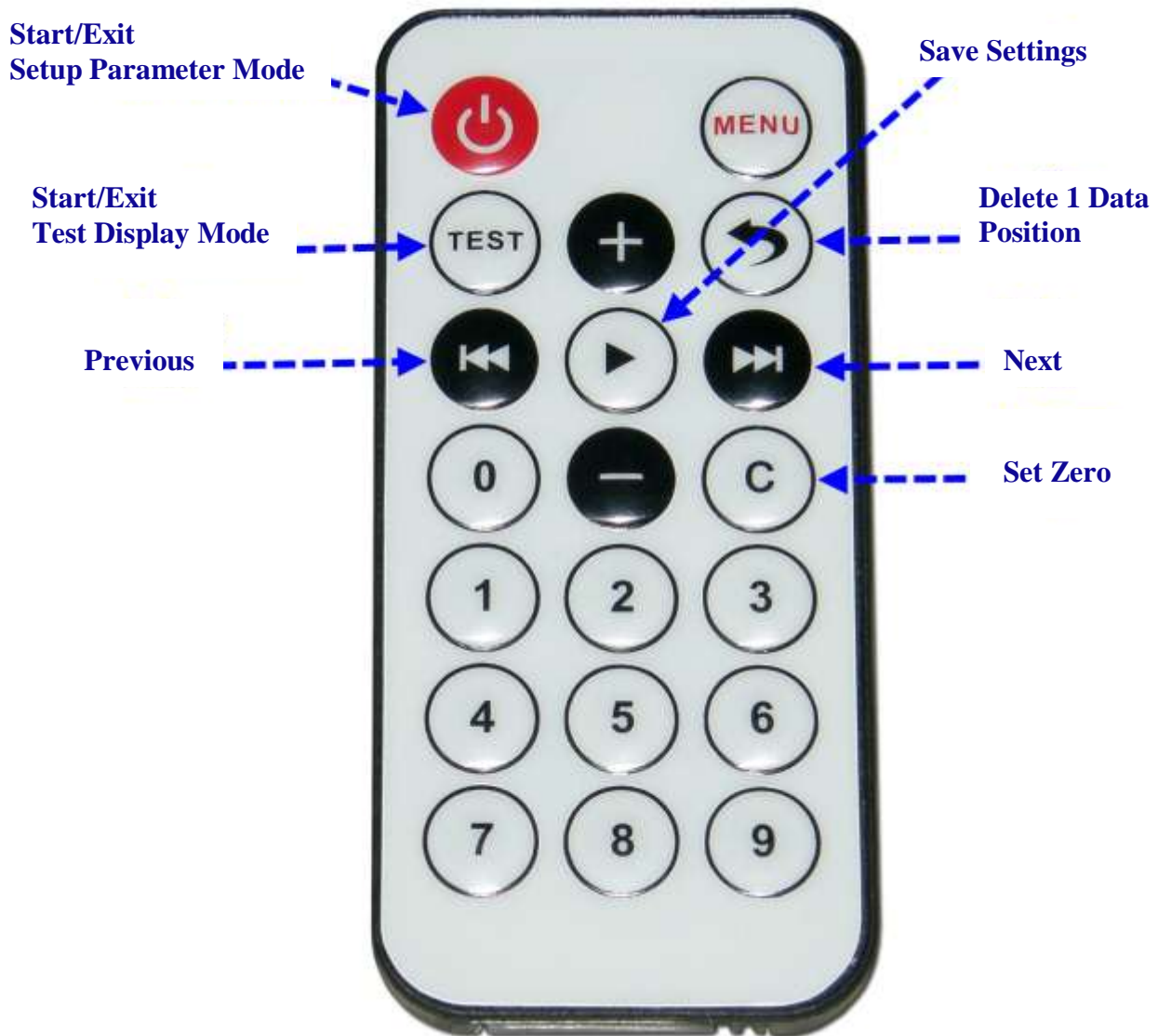
- **TARGET:** It displays the Target or quantity of product that will be counted. This TARGET can be independently setup in the range of +/-999.999.
- **ACTUAL:** It displays the actual counting of product that is in the range of +/-999,999. The counting value will increase by 1 every time Signal Input Count Up is stimulated and the counting value will decrease by 1 every time Signal Input Count Down is stimulated. The counting value will be stored until user resets the new one instead. When it sends out signal to stimulate the Signal Input Reset 1 time, the counting will be reset and then returns to the initial value that is equal to the setting Reset Value.
- **DIFFERENCE(DIFF.):** It displays the different value between TARGET and ACTUAL in the range of +/-999,999. If the different value is lower than -999,999, it uses decimal point of 7-Segment at the rightmost digit to display the minus sign instead. For example, if the different value is "**-1,000,000**", it will display the value as "**1,000,000.**" instead.

SPECIFICATIONS

- 7-Segment Display with 0.56 inch height, 7-Digit, and 3-Row displays the counting or displays 7-digit numeric value independently. It receives the Command through Serial Port RS422/485.
- 3-CH Circuit INPUT OPTO-ISOLATE receives Signal Count-Up, Count-Down and RESET; each Channel supports Input Contact and NPN/PNP Sensor.
- Maximum speed for counting, excluding Debounce Input is
    - 500Hz(2mS) does not send any counting value through RS485(SW[1]=OFF:RS485 Disable).
    - 40Hz(25mS) sends the counting through RS485 by Baudrate 19200 BPS.
- Support Parameters Setup through IR Remote and Port RS422/485.
- 1-CH Signal ALARM as Contact Relay (NO/NC/COMMON)
- 1-CH Serial Port RS422/485 Full Duplex 4-Wire
- Support both Programmable Counter Mode and Terminal Display Mode that through Serial Port RS42/485 Full Duplex 4-Wire with DIP SWITCH to setup 6 ID Codes independently.
    - Terminal Display ASCII Code Command
    - Terminal Display Binary HEX Code Command
    - Terminal Display Counter Code Command
- Use ET-MINI CNT6 as Display to add more positions of Counter Display to display the same counting values as the main ET-MINI CNT6.
- Be compatible with 12-24VDC Power Supply
- Box Size: 5.25 x 12.00 x 17.50 cm.

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How to Setup Parameters of Counter

There are 2 ways to setup Parameter of Counter. Firstly, it uses IR Remote; and secondly, it uses Program Setup of Computer PC to send Command Settings through RS422/485 (it requires Converter Device to convert Signal USB to RS422/485 if computer PC has not any Port RS232 or RS422; or, it requires Converter Device to convert Signal RS232 to RS422/485 if computer PC already has RS232). The method to setup values through IR Remote is described below;

**Start/Exit
Setup Parameter Mode**

Save Settings

**Start/Exit
Test Display Mode**

**Delete 1 Data
Position**

Previous

Next

Set Zero

It shows function of Keys to setup ET-MINI CNT6.

How to setup Parameters by IR Remote

1. Press Key (Power) and follow by numeric keys (0) to (7) that is the ID Code numbers of the device, respectively to enter the Setup Mode. When entered the Setup Mode completely, the display of numbers on all 3 lines is listed as follows;
   - The 1st Line (the Upper line) shows menu of Setup such as *tARGEt(Target), ACtUAL(Actual Count), PrESEt(Preset), dLY-00(Debounce-In0:Count Up), dLY-01(Debounce-In1:Count Down), dLY-02(Debounce-In2:Reset)* and *ALArM(Alarm)*.
   - The 2nd Line shows old setting values of the Parameter that have already been setup.
   - The 3rd Line shows value of the Parameter that user requires editing and changing. The display always blinks while user is changing the value. After inputted the new numeric value completely, please press the Key (>) to save the new one.
2. Press Key (>>) and (<<) to go forward and go backward; choose the preferable Menu to setup.
3. Press Key (>) to save the new setting value.
4. Press Key (+) or (-) to setup sign of number.
5. Press Key (<) to delete a numeric value in the box and the edit a value at the last digit.
6. Press Key (C) to clear and change the numeric value in the box to be 0.
7. Press numeric Key (0) to (9) to setup the preferable values.
8. Press Key (Power) to exit the Setup Mode.
   - **tArGEt** sets *Target* value in the range of -999,999 to +999,999.
   - **ACtUAL** sets *Actual* value in the range of -999,999 to +999,999.
   - **PrESEt** sets *Preset* value that is the initial counting. After Reset, the counting value of Counter is normally setup as 0.
   - **dLY-00** sets *Debounce Input0(Count Up);* it sets unit of Debounce Time as mS in the range of 0-999.
   - **dLY-01** sets *Debounce Input1(Count Down);* it sets the unit of Debounce Time as mS in the range of 0-999.
   - **dLY-02** sets *Debounce Input2(Reset);* it sets the unit of Debounce Time as mS in the range of 0-999.
   - **ALArM** sets *Alarm*. If it is set as 0, it cancels the Alarm (Disable); if it is set as 1, it enables the function Alarm (Enable) or notification.

How to setup Parameters by computer PC

How to connect Signal INPUT

ET-MINI CNT6 has 3-CH INPUT; UP, DOWN, and RESET; and each INPUT has 3 Wires; +VIN, IN, and COM. Each INPUT Channel can be compatible with various types of Signal INPUT such as Volt Signal or Input Contact and Sensors.

- **+VIN** is OUTPUT Voltage that is connected from the Voltage position to supply to POWER SUPPLY of the device through Connector POWER; it is in the range of 12VDC-24VDC to be externally connected to supply Sensors.
- **IN (IN0, IN1, IN2)** is the position that receives Signal INPUT to supply to the device; it can receive a maximum Voltage at +24VDC.
- **COM** is Common of Signal INPUT.

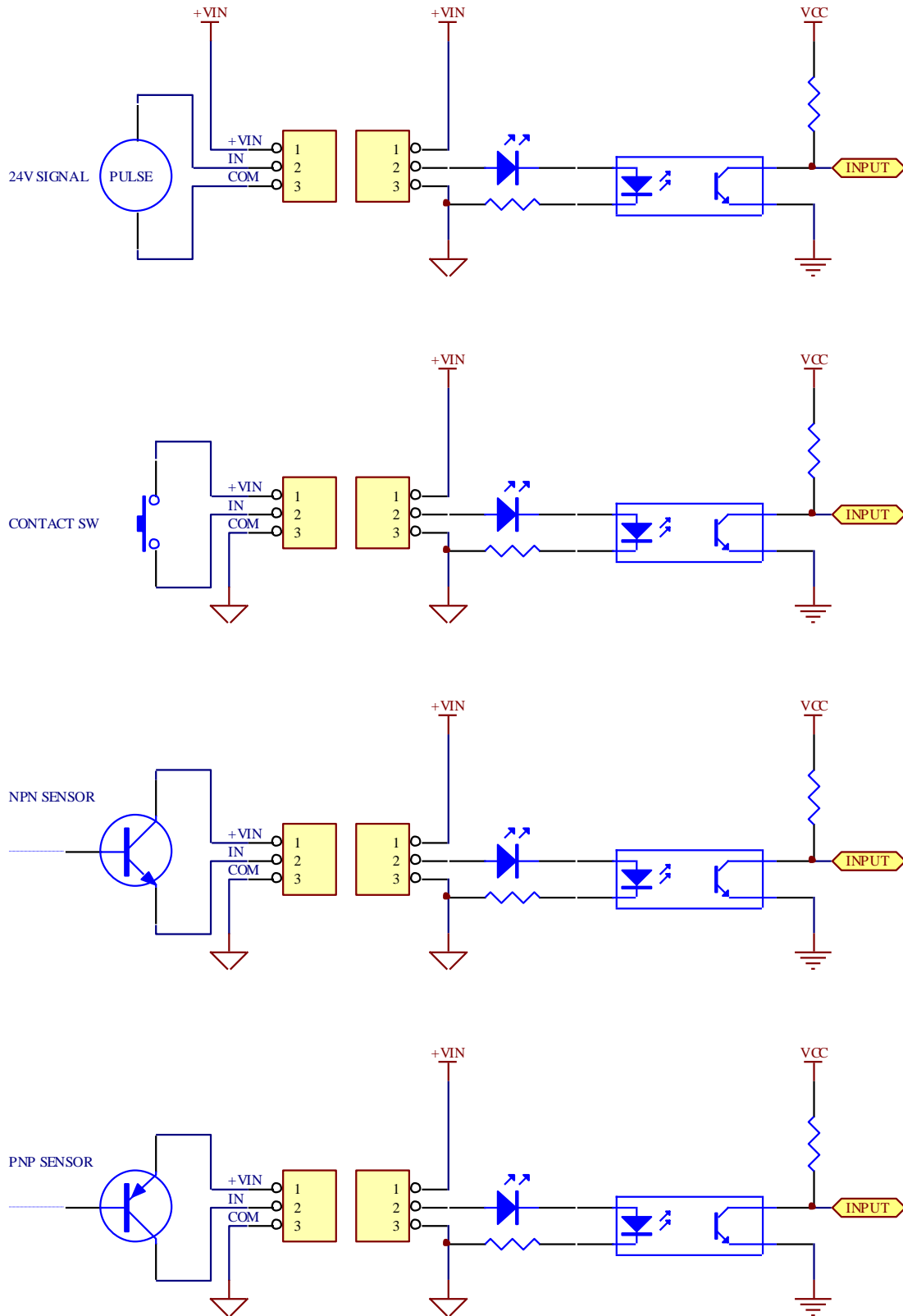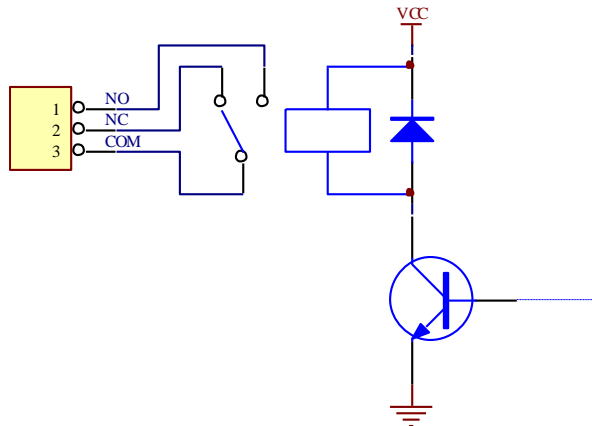**It shows Connector Signal INPUT of ET-MINI CNT6.**

Diagram shows various formats of connecting Signal INPUT for ET-MINI CNT6.

Signal ALARM

Signal ALARM is Contact Relay type. It is activated when Alarm is setup as "1"; but, if Alarm is setup as "0", it does not send out any Signal Alarm while the device is running. This Signal Alarm will be activated when the counting value of Actual Counter is equal or greater than Target Counter.

Value	Down				Reset	Up			
Target	1000	1000	1000	1000	1000	1000	1000	1000	1000
Actual	-1001	-1000	-999	-1	0	1	999	1000	1001
Diff.	-2001	-2000	-1999	-1001	-1000	-999	-1	0	1
Alarm	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON

Value	Down				Reset	Up			
Target	0	0	0	0	0	0	0	0	0
Actual	-1001	-1000	-999	-1	0	1	999	1000	1001
Diff.	-1001	-1000	-999	-1	0	1	999	1000	1001
Alarm	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON

Value	Down				Reset	Up			
Target	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000	-1000
Actual	-1001	-1000	-999	-1	0	1	999	1000	1001
Diff.	1	0	-1	-999	-1000	-1001	-1999	-2000	-2001
Alarm	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF

Table shows the feature of Difference Display and Alarm.

SIGNAL RS485

    This ET-MINI CNT6 is used as network operation by Signal 4-Wire RS485 (Full Duplex). There is DIP Switch ID0, ID1, ID2 to setup ID Code of the device; in this case, it can setup 8 Codes with the number 0-7.

ID2	ID1	ID0	ID Code
OFF	OFF	OFF	0
OFF	OFF	ON	1
OFF	ON	OFF	2
OFF	ON	ON	3
ON	OFF	OFF	4
ON	OFF	ON	5
ON	ON	OFF	6
ON	ON	ON	7

- RS485 ENA is setup to send counting value of Counter to the RS485 network. If *Switch[1]:RS485 ENA* is setup in the position of OFF, it disables the device from sending counting value of Counter to the RS485 network to protect data from crashing in the same bus. If more than 1 ET-MINI CNT6 is connected together as Counter in the same bus, the device that is setup to be Master must send Command to read a value of Counter in the Bus by self. If *Switch[1]:RS485 ENA* is setup in the position of ON, ET-MINI CNT6 always sends out the counting value to the RS485 Bus every time the counting occurs. If more than 1 ET-MINI CNT is connected together in the same RS485 Bus, data may be crashed and the receiver can't receive data correctly. Although this *Switch[1]* is setup to any position, ET-MINI CNT6 always sends back the data to the Bus instantly after received the Command from Master to read the data.
- RXA(+) and RXB(-) is a pair of Signal on the receiver side to receive data from RS485 Bus to ET-MINI CNT6.
- TXA(+) and TXB(-) is a pair of Signal on the sender side to send out data from ET-MINI CNT6 to RS485 Bus.

Example shows how to connect Signal RS485 between ET-MINI CNT6 and computer PC by ET-USB/RS422/485 V2.0.

How to use ET-MINI CNT6 as COUNTER and together with SLAVE DISPLAY

For this connection type, it can use Master to setup Parameters and check counting values of Counter all the time; moreover, it can add more Display to shows counting values in various positions by using only one Signal Counting.

When connecting Signal, it connects Signal TXA(+) and TXB(-) from Master to Signal RXA(+) and RXB(-) of ET-MINI CNT6 that is used as Counter; next, it connects Signal TXA(+) and TXB(-) from ET-MINI CNT6 that is used as Counter to Signal RXA(+) and RXB(-) of Master and ET-MINI CNT6 that is used as Slave Display.
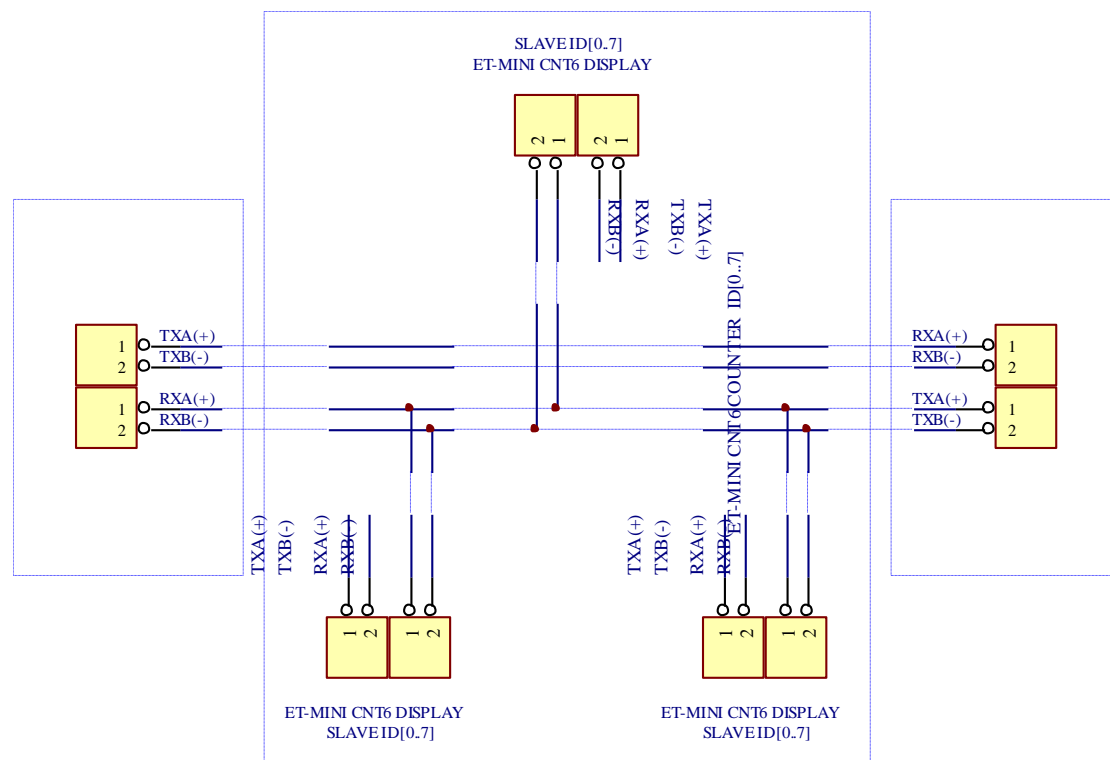

Diagram shows how to connect Signal RS485 together with ET-MINI CNT6 COUNTER & DISPLAY by using PC as Master.

How to use ET-MINI CNT6 as COUNTER and together with SLAVE DISPLAY

This connection type can use ET-MINI CNT6 as Master Counter together with ET-MINI CNT that is used as Slave Duplex without connecting computer PC in the system. Parameters of ET-MINI CNT6 that is used as Master Counter are setup through IR Remote mainly. When connecting Signal, it connects Signal TXA(+) and TXB(-) from ET-MINI CNT6 that is used as Master to Signal RXA(+) and RXB(-) of ET-MINI CNT6 that is used as Slave Display. For Signal TXA(+) and TXB(-) from ET-MINI CNT6 that is used as Slave Display, it may be connected to Signal RXA(+) and RXB(-) of Master or it may be floated.
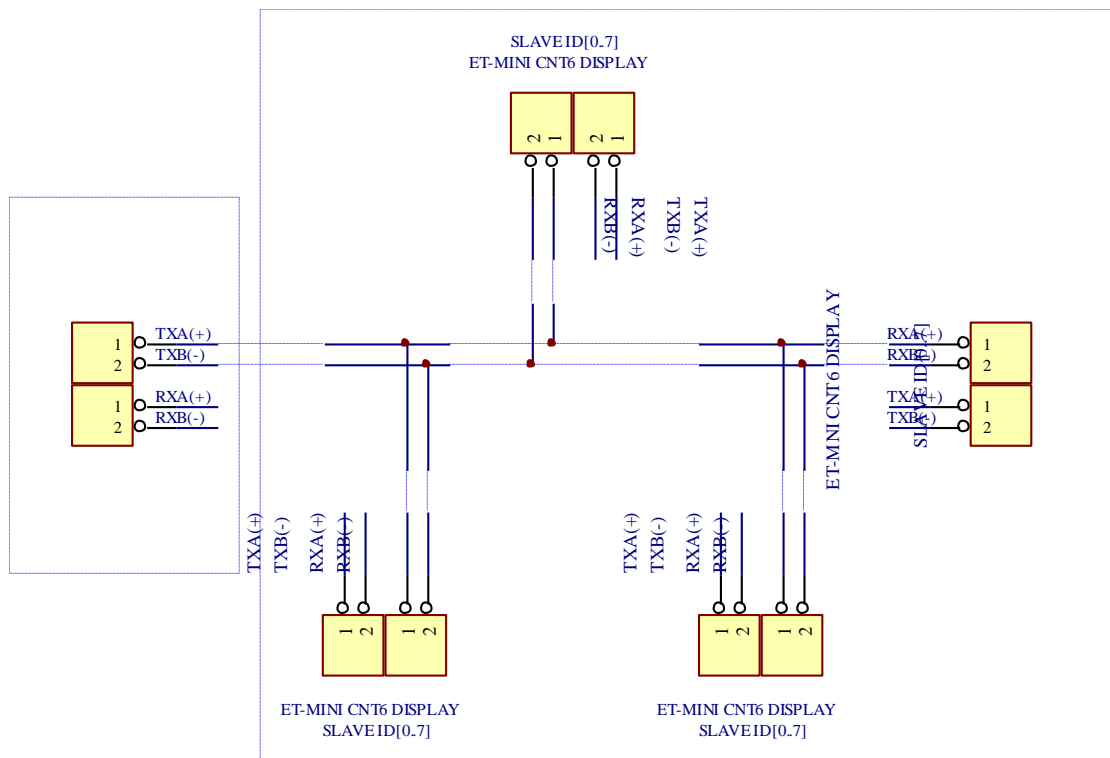

Diagram shows how to connect Signal RS485 by using ET-MINI CNT6 as Master Counter and together with Slave Display.

How to use ET-MINI CNT6 as Slave Display

This operation mode is one directional communication; ET-MINI CNT6 waits for receiving data and then displays the received data on the Display but it does not send any data back to Master. When connecting Signal RS485, it connects Signal TXA(+) and TXB(-) from Master to Signal RXA(+) and RXB(-) of ET-MINI CNT6 Slave according to the direction. For Signal TXA(+) and TXB(-) from ET-MINI CNT6, it may be connected back to Signal RXA(+) and RXB(-) of Master or it may be floated because it hasn't any effect on operation.

There are 3 formats of Command Set to command ET-MINI CNT6 to display the counting value; user is free to choose any preferable format.
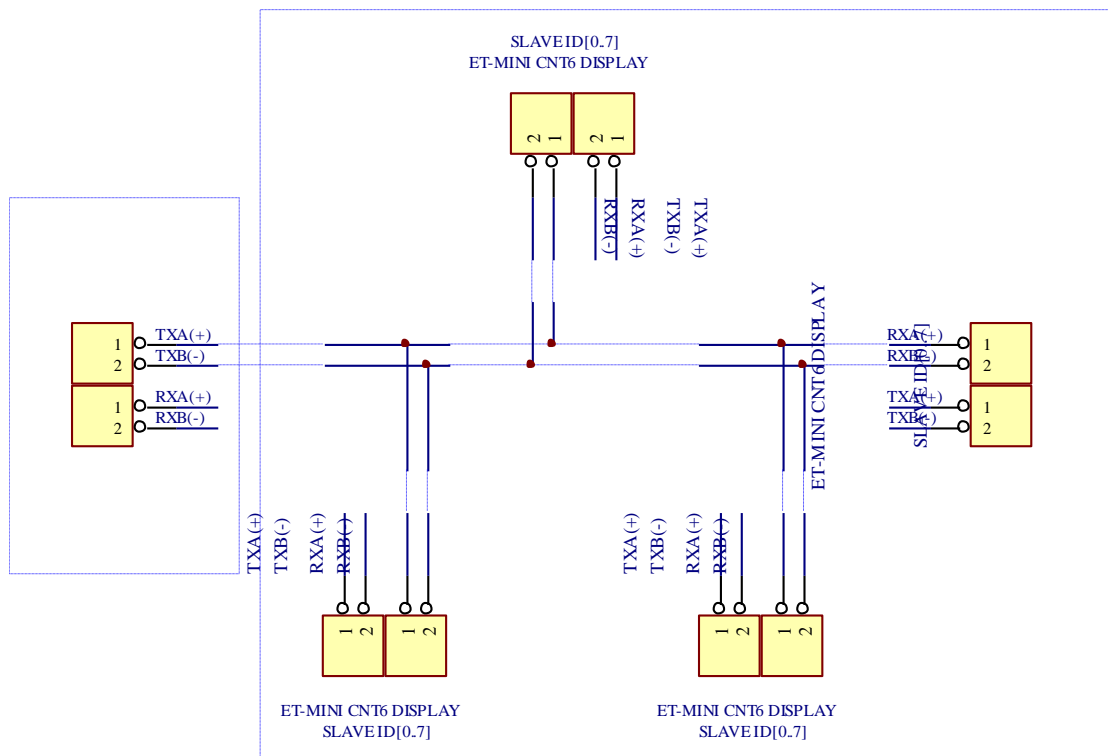

Diagram shows how to connect Signal RS485 by using PC as Master and together with ET-MINI CNT6 as SLAVE DISPLAY.

Protocol for sending-receiving data

When communicating to ET-MINI CNT6, it requires Serial Port Communication in the format of RS422/485 Full Duplex 4-Wire as listed below;

- Baudrate = 19,200 BPS
- Data Bit = 8 Bit
- Parity Bit = None
- Stop Bit = 1

<STX><ID><CMD><Sep1><Packet Type><Sep2><Data..><ETX>

- **STX** is 1-Byte Initial Code to start the command; its value is ASCII Code of "*****" or **2AH**.
- **<ID>** is 1-Byte ID Code of the device; its value is ASCII Code of numeric ID Code "**0**" – "**7**" or **30H**–**37H**.
- **<CMD>** is 1-Byte Code Command; its value is ASCII Code of the Command.
  - o "**A**" or **41H** means ASCII Command Display.
  - o "**B**" or **42H** means Binary HEX Command Display.
  - o "**C**" or **43H** means Counter Command Display.
  - o "**R**" or **52H** is the command to read Parameter from ET-MINI CNT6.
  - o "**W**" or **57H** is the command to setup Write Parameter for ET-MINI CNT6.
- **<Sep1>** is 1-Byte Code to separate data of Seperate1; its value is ASCII Code of the sign "**:**" or **3AH**.
- **<Packet Type>** is 1-Byte Code to identify type of data in the Command; its value is ASCII Code of number "**0**" – "**7**" or **30H, 37H**. When
  - o "**?**" is used with the Command "**R**" only; it means that it requires reading all Parameters of ET-MINI CNT6. For example, "**0R:?=?"<Cr>*, it means it reads all Parameters of ET-MINI CNT6 that has the ID Code = "0".
  - o "**0**": This Command is data for reading/writing of Target Value.
  - o "**1**": This Command is data for reading/writing of Actual Value.
  - o "**2**": This Command is data for reading/writing of Difference Value.
  - o "**3**": This Command is data for reading/writing of Reset Value.
  - o "**4**": This Command is data for reading/writing of Debounce Input0 Value.
  - o "**5**": This Command is data for reading/writing of Debounce Input1 Value.
  - o "**6**": This Command is data for reading/writing of Debounce Input2 Value.
  - o "**7**": This Command is data for reading/writing of Alarm Value.
- **<Sep2>** is 1-Byte Code to separate data of Seperate2; its value is ASCII Code of the sign "**=**" or **3DH**.

- **<Data>** is ASCII Code to setup data in Packet; its size is uncertain, it depends on format of Packet Type.
  - o **"?"** is 1-Byte Data to setup format of Command to read data.
  - o **Target Value** is 8-Byte Data. The first byte is the sign **"+"** or **"-"** and then followed by 7-Byte numeric value.
  - o **Actual Value** is 8-Byte Data. The first byte is the sign **"+"** or **"-"** and then followed by 7-Byte numeric value.
  - o **Difference Value** is 8-Byte Data. The first byte is the sign **"+"** or **"-"** and then followed by 7-Byte numeric value.
  - o **Reset Value** is 8-Byte Data. The first byte is the sign **"+"** or **"-"** and then followed by 7-Byte numeric value.
  - o **Debounce Input0 Value** is 8-Byte Data. The first byte always is the sign **"+"** and then followed by 7-Byte numeric value. This Debounce sets data in the range of 0-999 only; so, the numeric value of the first 4-digit is always setup as "0" such as "+0000050".
  - o **Debounce Input1 Value** is 8-Byte Data. The first byte always is the sign **"+"** and then followed by 7-Byte numeric value. This Debounce sets data in the range of 0-999 only; so, the numeric value of the first 4-digit is always setup as "0" such as "+0000050".
  - o **Debounce Input2 Value** is 8-Byte Data. The first byte always is the sign **"+"** and then followed by 7-Byte numeric value. This Debounce sets data in the range of 0-999only; so, the numeric value of the first 4-digit is always setup as "0" such as "+0000050".
  - o **Alarm Value** is 8-Byte Data. The first byte always is the sign **"+"** and then followed by 7-Byte numeric value. The Alarm value is set in the range of 0 to 1 only; so the numeric value of the first 6-digit is always setup as "0" such as "+0000001".
- **<ETX>** is the 1-Byte End Command; its value is ASCII Code of **Enter** or **13H**.

Example of using Command

It sends Command to read all Parameters of ET-MINI CNT6 Device No.ID0.

```
*0R:?=?<Cr>                Read all Parameters from Device ID0
```

ET-MINI CNT6 Device No.ID0 replies

```
*0C:0=+0000100<Cr>  Target of Device ID0 = +100
*0C:1=+0000000<Cr>  Actual of Device ID0 = 0
*0C:2=-0000100<Cr>  Difference of Device ID0 = -100
*0C:3=+0000000<Cr>  Reset of Device ID0 = 0
*0C:4=+0000050<Cr>  Debounce Input0 of Device ID0 = 50mS
*0C:5=+0000050<Cr>  Debounce Input1 of Device ID0 = 50mS
*0C:6=+0000050<Cr>  Debounce Input2 of Device ID0 = 50mS
*0C:7=+0000000<Cr>  Alarm of Device ID0 = 0(Disable)
```

It sends Command to read Target of ET-MINI CNT6 Device No.ID0.

```
*0R:0=?<Cr>                Read Target from Device ID0
```

ET-MINI CNT6 Device No.ID0 replies

```
*0C:0=+0000100<Cr>         Target of Device ID0 = +100
```

It sends Command to read Actual of ET-MINI CNT6 Device No.ID0.

```
*0R:1=?<Cr>                Read Actual from Device ID0
```

ET-MINI CNT6 Device No.ID0 replies

```
*0C:1=+0000000<Cr>         Actual of Device ID0 = 0
```

It sends Command to read Difference of ET-MINI CNT6 Device No.ID0.

```
*0R:2=?<Cr>
```
Read Difference from Device ID0

ET-MINI CNT6 Device CNT6 No.ID0 replies

```
*0C:2=-0000100<Cr>
```
Difference of Device ID0 = -100

It sends Command to read Reset to ET-MINI CNT6 Device No.ID0.

```
*0R:3=?<Cr>
```
Read Reset from Device ID0

ET-MINI CNT6 Device No.ID0 replies

```
*0C:3=-0000100<Cr>
```
Reset of Device ID0 = -100

It sends the Command to read Debounce Input0 to ET-MINI CNT6 Device No.ID0.

```
*0R:4=?<Cr>
```
Read Debounce Input0 from Device ID0

ET-MINI CNT6 Device No.ID0 replies

```
*0C:4=-0000100<Cr>
```
Debounce Input0 of Device0 = -100

It sends the Command to read all Parameters to ET-MINI CNT6 Device No.ID0.

```
*0R:5=?<Cr>
```
Read Debounce Input1 from Device ID0

ET-MINI CNT6 Device No.ID0 replies

```
*0C:5=-0000100<Cr>
```
Debounce Input1 of Device0 = -100

It sends the Command to read all Parameters to ET-MINI CNT6 Device No.ID0.

```
*0R:6=?<Cr>
```
Read Debounce Input2 from Device ID0

ET-MINI CNT6 Device No.ID0 replies

*0C:6=-0000100\<Cr>   Debounce Input2 of Device0 = -100

It sends the Command to read all Parameters to ET-MINI CNT6
Device No.ID0.

*0R:7=?\<Cr>   Read Alarm from Device ID0

ET-MINI CNT6 Device No.ID0 replies

*0C:7=+0000001\<Cr>   Difference of Device0 = -100

It sends the Command to setup Target to ET-MINI CNT6 Device
No.ID0.

*0W:0=+0123456\<Cr>   Setup Target for Device ID0 = +123456

ET-MINI CNT6 Device No.ID0 replies

*0C:0=+0123456\<Cr>   Target of Device ID0 = +123456

It sends the Command to setup Actual to ET-MINI CNT6 Device
No.ID0.

*0W:1=+123456\<Cr>   Setup Actual for Device ID0 = +123456

ET-MINI CNT6 Device No.ID0 replies

*0C:1=+0123456\<Cr>   Actual of Device ID0 = +123456

It sends the Command to setup Alarm to ET-MINI CNT6 Device
No.ID0.

*0W:7=+0000001\<Cr>   Setup Alarm from Device ID0=1(Enable)

ET-MINI CNT6 Device No.ID0 replies

*0C:7=+0000001\<Cr>   Alarm of Device ID0 = 1(Enable)

How to use ET-MINI CNT6 as Screen Display by ASCII Command Display

It commands the Display of 7-Segment to display values according to ASCII Code of numeric values and letters as required; it can display values in the format of the dot sign (.), the minus sign (-), the numeric values *0-9*, and the letters *A B C D E F G H I J L M N O P R S T U Y*. For other letters *K Q V W X Z* and other signs, it cannot be displayed; if code of these values are sent out, it will be displayed as Space instead. This Command has uncertain amount of byte because it depends on display code in the command. The format of Command is displayed as follows;

<STX><ID><CMD><Sep1><Line><Sep2><Display ASCII Code><ETX>

STX	<ID>	<CMD>	<Sep1>	<Line>	<Sep2>	<Display ASCII Code>	<ETX>
*	<ID>	A	:	<Line>	=	ASCII Display Code	<Cr>
2AH	*0..7*	41H	3AH	*0..2*	3DH	ASCII Display Code	0DH

- **STX** is 1 Byte Initial Code to start the Command; its value is ASCII Code of "*****" or **2AH**.
- **<ID>** is 1 Byte ID Code of the device; its value is ASCII Code of numeric ID Code "**0**" – "**7**" or **30H-37H**.
- **<CMD>** is 1 Byte Code Command; its value is ASCII Code of "**A**" or **41H**.
- **<Sep1>** is 1 Byte Code to separate data of Seperate1; its value is ASCII Code of the sign "**:**" or **3AH**.
- **<Line>** is 1 Byte Code to setup line of displaying value; its value is ASCII Code of the numeric value "**0**", "**1**", "**2**" or **30H, 31H, 32H.** When
  - o "**0**": It commands to display value in the upper line (TARGET).
  - o "**1**": It commands to display value in the middle line (ACTUAL).
  - o "**2**": It commands to display value in the lower line (DIFF.).
- **<Sep2>** is 1 Byte Code to separate data of Seperate2; its value is ASCII Code of "**=**" or **3DH.**
- **<Display Binary Code>** is ASCII Code for displaying value. If ASCII Code that is sent out cannot be displayed on the Screen Display, the device will display the received value as Space instead. Or, if it sends out too much ASCII Codes to display on the Screen Display, the device only displays the first 7-digit value.
- **<ETX>** is 1 Byte End Code to end the command; its value is ASCII Code of **Enter** or **13H.**

Example of using ET-MINI CNT6 as Screen Display by ASCII Command Display

*0A:0=1234567<Cr>   TARGET is displayed as 1234567

*0A:1=1234.567<Cr>   ACTUAL is displayed as 1234.567

*0A:2=-1234.56<Cr>   DIFF. is displayed as -1234.56

*0A:2=Error<Cr>   DIFF. is displayed as Error

*0A:2=EMPTY<Cr>   DIFF. is displayed as Empty

*0A:2=FULL<Cr>   DIFF. is displayed as FULL

*0A:2=TIME-01<Cr>   DIFF. is displayed as TIME-01

How to use ET-MINI CNT6 as Screen Display by Binary HEX Command Display

It commands 7-Segment Display to display numeric values, letters or any sign according to user's design and settings. User has to set Display Code and send out data to setup ON/OFF of 7-Segment by self. This Command has 21 Byte Data and the format of Command is shown below;

<STX><ID><CMD><Sep1><Line><Sep2><Display Binary HEX Code><ETX>

STX	<ID>	<CMD>	<Sep1>	<Line>	<Sep2>	<14 Byte Display Binary HEX Code>														<ETX>
*	<ID>	B	:	<Line>	=	d	d	d	d	d	d	d	d	d	d	d	d	d	d	<Cr>
2AH	0..7	42H	3AH	0..2	3DH	DG6		DG5		DG4		DG3		DG2		DG1		DG0		0DH

- **STX** is 1 Byte Initial Code to start the Command; its value is ASCII Code of "*" or **2AH.**
- **<ID>** is 1 Byte ID Code of the device; its value is ASCII Code of numeric ID Code "0" – "7" or **30H–37H.**
- **<CMD>** is 1 Byte Code Command; its value is ASCII Code of "B" or **42H.**
- **<Sep1>** is 1 Byte Code to separate data of Seperate1; its value is ASCII Code of the sign ":" or **3AH.**
- **<Line>** is 1 Byte Code to setup line of displaying value; its value is ASCII Code of the numeric value "0", "1", "2" or **30H, 31H, 32H.** When
  o "0": It commands to display value in the upper line (**TARGET**).
  o "1": It commands to display value in the middle line (**ACTUAL**).
  o "2": It commands to display value in the lower line (**DIFF.**).
- **<Sep2>** is 1 Byte Code to separate data of Seperate2; its value is ASCII Code of "=" or **3DH.**
- **<Display Binary HEX Code>** is 14 Byte Display Code of all 7-digit of 7-Segment Display. Each digit uses 2 Byte Code to setup the display; its value is ASCII Code of HEX Code to setup the display of 7-Segment.
- **<ETX>** is 1 Byte End Code to end the command; its value is ASCII Code of **Enter** or **13H.**

How to setup Display as Binary HEX Code

The Display as Binary Code is very flexible format because user can easily design format of display and command the display as required. When the 7-Segment Display is setup to run in this operation mode, it needs replacing the ON Segment with Bit Data of "1" and it needs replacing the OFF Segment with Bit Data of "0". Each digit of 7-Segment Display includes 8 parts of display that are A B C D E F G and DP, respectively. The display of each Segment will be setup through 1 Bit Data, please look at the figure below;
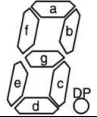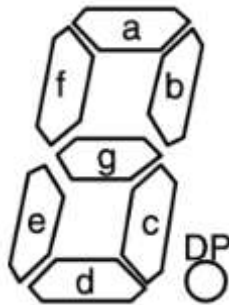

Dp	A	B	C	D	E	F	G
D7	D6	D5	D4	D3	D2	D1	D0

Format of setting Data to control the display of 7-Segment

For example, if setting 7-Segment to display the numeric value of "8", it has to setup the Segment A-G to be state of ON only and then it has to setup the Segment of DP to be state of OFF; and finally, it displays the numeric value of "8" as required as listed below;

Dp	A	B	C	D	E	F	G
D7	D6	D5	D4	D3	D2	D1	D0
0	1	1	1	1	1	1	1

As mentioned above, the value of data is "**01111111**" or **7FH**; so, the display must be setup as 2-digit ASCII Code of "**7**" and "**F**" or **37H** and **46H**, respectively.

Dp	A	B	C	D	E	F	G	Segment	
D7	D6	D5	D4	D3	D2	D1	D0	HEX Code	
0	1	1	1	1	1	1	0	7E	
0	0	1	1	0	0	0	0	30	
0	1	1	0	1	1	0	1	6D	
0	1	1	1	1	0	0	1	79	
0	0	1	1	0	0	1	1	33	
0	1	0	1	1	0	1	1	5B	
0	1	0	1	1	1	1	1	5F	
0	1	1	1	0	0	0	0	70	
0	1	1	1	1	1	1	1	7F	
0	1	1	1	1	0	1	1	7B	
0	1	1	1	0	1	1	1	77	
0	0	0	1	1	1	1	1	1F	
0	1	0	0	1	1	1	0	4E	
0	0	1	1	1	1	0	1	3D	
0	1	0	0	1	1	1	1	4F	
0	1	0	0	0	1	1	1	47	

Example of creating Code to control the display of 7-Segment when being used in Binary Command Mode

Example of using ET-MINI CNT6 as Screen Display by Binary HEX Command Display

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*0B:0=7E306D79335B5F<Cr> TARGET is displayed as [0][1][2][3][4][5][6]

---

*0B:1=30303030303030<Cr> ACTUAL is displayed as [1][1][1][1][1][1][1]

---

*0B:2=01771F4E3D4F47<Cr> DIFF. is displayed as [-][A][B][C][D][E][F]

Example of using ET-MINI CNT6 as Screen Display by Binary HEX Command Display

How to use ET-MINI CNT6 as Screen Display by Counter Command Display

It commands the 7-Segmnet Display of ET-MINI CNT6 to display values according to counting of the Counter; it increases more positions of displaying values of Counter to display the same counting values at various locations but it uses only one position of Counter. It has to setup ID Code of ET-MINI CNT6 that is used as Display according to ID Code of ET-MINI CNT6 that is used as Counter, but it does not connect any Signal Counting to ET-MINI CNT6 that is used as Display. Moreover, it has it setup the operation of *Dip_SW[1]* as *OFF:RS485 Echo Disable*.

<STX><ID><CMD><Sep1><Line><Sep2><Display ASCII Code><ETX>

STX	<ID>	<CMD>	<Sep1>	<Line>	<Sep2>	<Counter Value>	<ETX>
*	<ID>	C	:	<Line>	=	ASCII Counter Value	<Cr>
2AH	*0..7*	43H	3AH	*0..2*	3DH	ASCII Counter Value	0DH

- **STX** is 1 Byte Initial Code to start the Command; its value is ASCII Code of "*****" or **2AH.**
- **<ID>** is 1 Byte ID Code of the device; its value is ASCII Code of numeric values "**0**" - "**7**" or **30H**-**37H.**
- **<CMD>** is 1 Byte Code Command; its value is ASCII Code of "**C**" or **43H.**
- **<Sep1>** is 1 Byte Code to separate data of Seperate1; its value is ASCII Code of the sign ":" or **3AH.**
- **<Line>** is 1 Byte Code to setup line of displaying value; its value is ASCII Code of the numeric value "**0**", "**1**", "**2**" or **30H, 31H, 32H.** When
  o "**0**": It commands to display value in the upper line (**TARGET**).
  o "**1**": It commands to display value in the middle line (**ACTUAL**).
  o "**2**": It commands to display value in the lower line (**DIFF.**).
- **<Sep2>** is 1 Byte Code to separate data of Seperate2; its value is ASCII Code of the sign "**=**" or **3DH.**
- **<ASCII Counter Value>** is 8-digit ASCII Code of Counter Value that will be displayed. The first digit is ASCII Code of the sign plus (+) or minus (-) and then followed by ASCII Code of the 7-digit numeric value 0-9.
- **<ETX>** is 1 Byte End Code to end the command; its value is ASCII Code of **Enter** or **13H.**

**Example of using ET-MINI CNT8 as Screen Display by Counter
Command Display**

*0C:0=+0123456<Cr>   TARGET is displayed as 123456

*0C:1=+0001234<Cr>   ACTUAL is displayed as 1234

*0C:2=-122222<Cr>   DIFF. is displayed as -122222

Example of use

If it requires counting amount of car in a car park with a parking capacity of 500, it has to setup Parameters of Counter as follows;

- Setup **Target = 500** (a maximum of parking capacity)
- Setup **Actual = 0** (the actual parked cars in the car park)
- Setup **Preset = 0** (starts counting at 0)
- Setup **Alarm = 1** (Enable Alarm)
- Connect **Input-Up Counter** to the Signal for counting car that enters a car park.
- Connect **Input-Down Counter** to the Signal for counting car that exits a car park.
- Connect Signal **Reset** to Input Reset Counter

It starts running after reset the initial counting value of ACTUAL as 0; it notifies user to know that there is no any car in the car park. For the TARGET, it displays the value of 500 to notify user to know its parking capacity. For DIFF, it displays the remaining of available space that the car park can accept; in this case, it is -500. When a car enters the car park (Up Input), the ACTUAL value will be increased by 1 to show the actual quantity of the parked cars in the car park; but the DIFF value will be decreased by 1 because the available space of the car park decreases. In the meanwhile, when a car exits the car park (Down Input), the ACTUAL value will be decreased by 1 but the DIFF value will be increased by 1 because the available space of the car park increases.

For Signal ALARM, it can be applied to display state of operation; for example, *Contact NC(Normal Close)* is applied to enable/disable (ON/OFF) Green Tower Lamp and *Contact NO(Normal Open)* is applied to enable/disable (ON/OFF) Red Tower Lamp. In this case, if the counting value of ACTUAL does not reach the 500 yet, RELAY ALARM is inactive and the Green Tower Lamp is still lit up; it means that there is available space in the car park. But, when the counting value of ACTUAL is equal or more than 500, Signal RELAY ALARM activates and the Red Tower Lamp is lit up to notify user to know that the car park is full.

Example of counting many INPUTS

If there are a lot of Signal Counting but user requires using less position of Counter, especially the production line in factory. For example, the production line in factory has a lot of machinery to produces the same products at the same place according to the orders, user requires actually knowing total production of all machinery and the remaining of production but user does not require knowing the capability of each of machinery to produce the products. In this case, it can use ET-MC16 (Multi Counter 16 Channel) that supports 16-CH Input Counting to include Signal Counting that is connected from each of machinery; next, it sends the total Signal Counting to ET-MINI CNT6 that is only one device to count and display the total counting values to user.
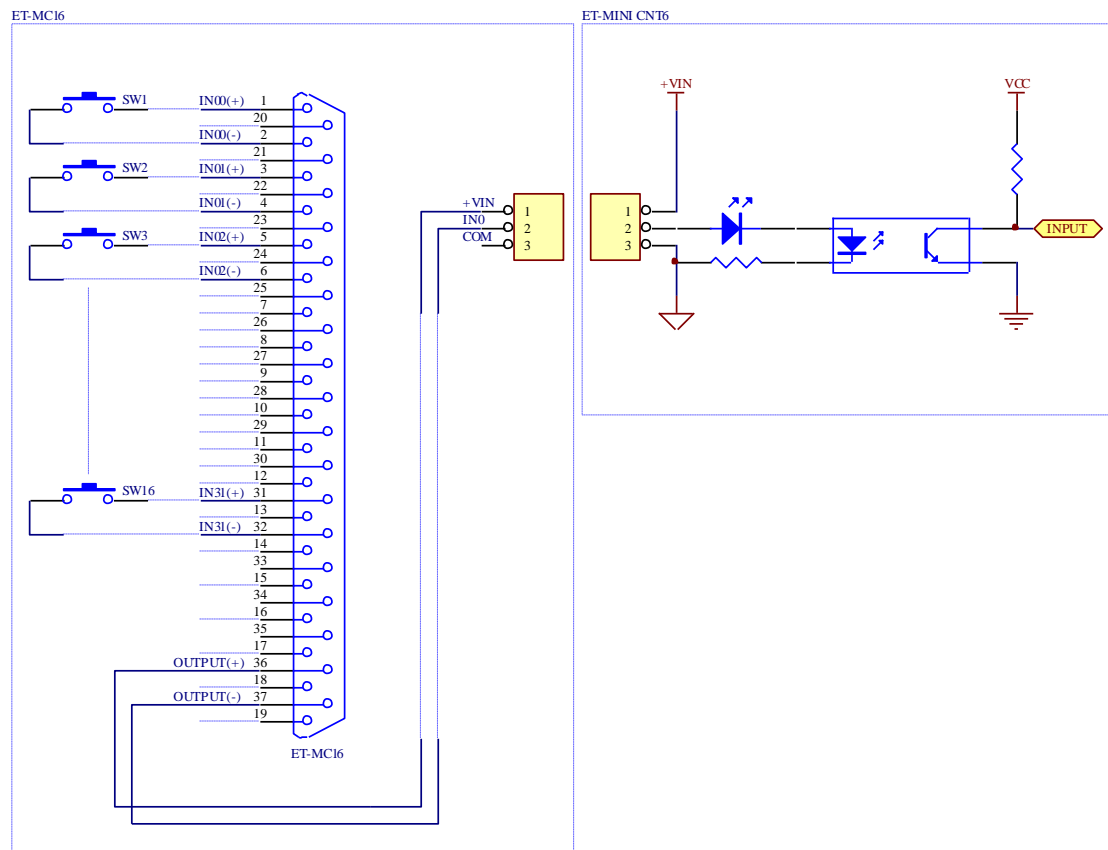

Diagram shows how to connect ET-MC16 together with ET-MINI CNT6 to include much Signal Input Counting.