

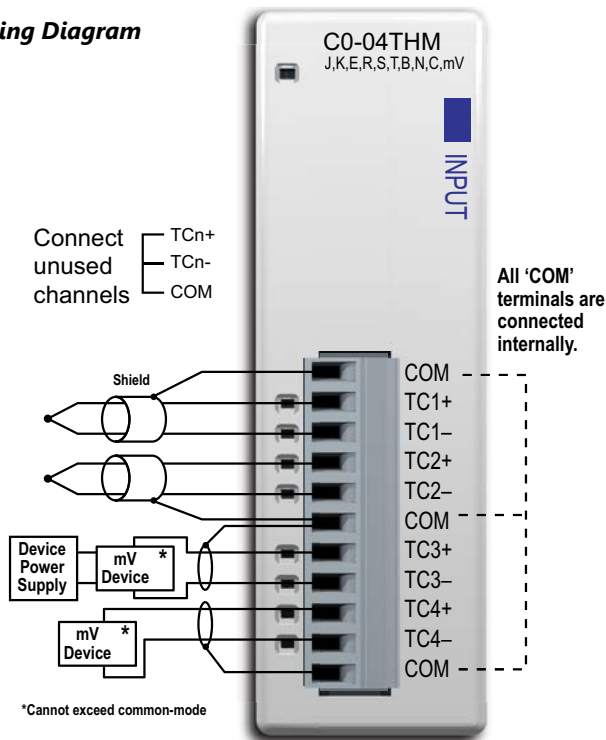
CLICK Stackable I/O Module Specifications

CO-04THM

4-Channel Thermocouple Input Module

4-channel thermocouple input module, 16-bit resolution (+/-0.1 degrees Celsius or Fahrenheit), Supports: J, K, E, R, S, T, B, N, C type thermocouples; voltage ranges are also supported, removable terminal block included (replacement AutomationDirect p/n [C0-8TB](#)).

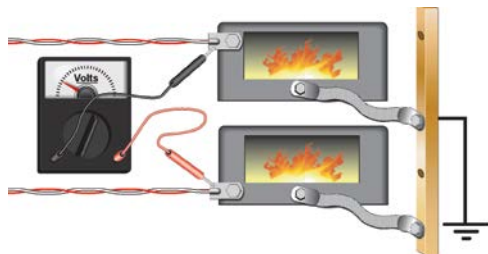
Wiring Diagram



NOTE: When using this module you must also use CLICK programming software and PLC firmware version V1.40 or later.



NOTE: With grounded thermocouples, take precautions to prevent having a voltage potential between thermocouple tips. A voltage less than -1.3 V or greater than +3.8 V between tips will skew measurements.



NOTE: When this module is used in a CLICK PLC system, it may take up to 11 seconds for initialization after power-up (see the table at right). During this time period, the RUN LED on the PLC Unit blinks to indicate the initialization process.

Input Specifications	
Inputs per Module	4
Common Mode Range	-1.3 to +3.8 V
Common Mode Rejection	100dB at DC and 130 dB at 60Hz
Input Impedance	>5 MΩ
Maximum Ratings	Fault protected inputs to ±50VDC
Resolution	±0.1°C or °F, 16 bit
Input Ranges	Type J: -190 to 760°C (-310 to 1400°F) Type K: -150 to 1372°C (-238 to 2502°F) Type E: -210 to 1000°C (-346 to 1832°F) Type R: 65 to 1768°C (149 to 3214°F) Type S: 65 to 1768°C (149 to 3214°F) Type T: -230 to 400°C (-382 to 752°F) Type B: 529 to 1820°C (984 to 3308°F) Type N: -70 to 1300°C (-94 to 2372°F) Type C: 65 to 2320°C (149 to 4208°F) 0 to 39.0625 mV ±39.0625 mV ±78.125 mV 0 to 156.25 mV ±156.25 mV 0 to 1.25 V
Cold Junction Compensation	Automatic
Thermocouple Linearization	Automatic
Accuracy vs. Temperature	±25 ppm per °C maximum
Linearity Error	±2°C maximum, ±1°C typical, monotonic with no missing codes
Maximum Inaccuracy	±3°C maximum (excluding thermocouple error)
Maximum Voltage Input Offset Error	0.05% at 0° to 55°C (32° to 131° F) typical 0.04% at 25°C (77°F)
Maximum Voltage Input Gain Error	0.06% at 25°C (77°F)
Maximum Voltage Input Linearity Error	0.05% at 0° to 55°C (32° to 131°F), typical 0.03% at 25°C (77°F)
Maximum Voltage Input Inaccuracy	0.1% at 0° to 55°C (32° to 131°F), typical 0.04% at 25°C (77°F)
Warm Up Time	30 minutes for ±1°C repeatability
Single Channel Update Rate	400ms
All Channel Update Rate	Single Channel Update Rate times the number of enabled channels on the module
Open Circuit Detection Time	Burn Out flag set and zero scale reading within 3 seconds
Conversion Method	Sigma - Delta

General Specifications	
Field to Logic Side Isolation	1800 VAC applied for 1 second (100% tested)
External DC Power Required	None
Bus Power Required (24VDC)	25mA
Thermal Dissipation	0.175 BTU per hour
Terminal Block Replacement	AutomationDirect p/n C0-8TB
Weight	3.1 oz (86g)

Not Compatible with ZIPLink Pre-Wired PLC Connection Cables and Modules.



CO-04THM Initialization Time	
The Number of Channels Used	With any Configuration
1	5 sec
2	7 sec
3	9 sec
4	11 sec

CLICK Stackable I/O Module Specifications

General Specifications For All CLICK Stackable I/O Modules

These general specifications apply to all CLICK Stackable I/O Modules. Please refer to the appropriate I/O temperature derating charts under the PLC (CLICK PLC with built-in I/O), Option Slot module (CLICK PLUS only), and Stackable I/O module specification to determine best operating conditions based on the ambient temperature of your particular application.



NOTE: These modules are available to use with CLICK or CLICK PLUS systems.

General Specifications	
Operating Temperature	Analog, analog combo I/O modules only: 32°F to 140°F (0°C to 60°C); All other modules: 32°F to 131°F (0°C to 55°C), IEC 60068-2-14 (Test Nb, Thermal Shock)
Storage Temperature	-4°F to 158°F (-20°C to 70°C) IEC 60068-2-1 (Test Ab, Cold) IEC 60068-2-2 (Test Bb, Dry Heat) IEC 60068-2-14 (Test Na, Thermal Shock)
Ambient Humidity	30% to 95% relative humidity (non-condensing)
Environmental Air	No corrosive gases. Environmental pollution level is 2 (UL840)
Vibration	MIL STD 810C, Method 514.2, EC60068-2-27, Category [f], Procedure[VIII] JIS C60068-2-27 (Sine wave vibration test)
Shock	MIL STD 810C, Method 516.2, IEC60068-2-27, JIS C60068-2-27, Category [f], Procedure[VIII]
Noise Immunity	<EN61131-2> EN61000-4-2 (ESD) EN61000-4-3 (RFI) EN61000-4-4 (FTB) EN61000-4-5 (Surge) EN61000-4-6 (Conducted) EN61000-4-8 (Power frequency magnetic field immunity) <Local Test> Impulse noise 1µs, 1000V RFI: No interference measured at 150 and 450 MHz (5w/15cm)
Emissions	EN55011:1998 Class A; EN61000-6-4:2007+A1:2011
Agency Approvals	UL508, UL61010-2-201 (File No. E157382, E316037); CE (EN61131-2); CUL Canadian C22.2
Other	RoHS 2011/65/EU Amendment (EU)2015/863

Power Supplies

Power Supplies

The CLICK PLC family offers two 24VDC power supplies. They are identical except for the output current.

It is not mandatory to use one of these CLICK power supplies for the CLICK/CLICK PLUS PLC system. You can use any other 24VDC power supply that AutomationDirect.com offers, including the PSP24-DC12-1 12 to 24 VDC converter shown below.

CO-00AC Power Supply

Limited auxiliary AC power supply allows you to power the 24VDC CLICK C0 and C2 series PLCs with 100–240 VAC supply power. The 0.5 A DC power supply is capable of controlling the PLC plus a limited configuration based on the power budget of each I/O module. The CO-00AC is a low-cost solution for applications requiring only minimal I/O and power consumption. This power supply will not support a fully-populated CLICK PLC system with all possible I/O module combinations.

CO-01AC Power Supply

Expanded auxiliary AC power supply allows you to power the 24VDC CLICK C0 and C2 series PLCs with 100–240 VAC supply power. The 1.3 A DC power supply is capable of supporting a fully-populated CLICK PLC system with all possible I/O module combinations, with no concerns for exceeding the power budget.

PSP24-DC12-1 DC-DC Converter

With this DC-DC converter you can operate the CLICK/CLICK PLUS PLC with 12VDC input power.

CO-00AC



CO-01AC



CLICK 24VDC Power Supply Ratings

Part Number	Output Current	Price
CO-00AC	0.5 A	
CO-01AC	1.3 A	

CO-00AC Power Supply Input Specifications

Part Number	CO-00AC	CO-01AC
Input Voltage Range	85–264 VAC	
Input Frequency	47–63 Hz	
Input Current (typical)	0.3 A @ 100VAC, 0.2 A @ 200VAC	0.9 A @ 100VAC, 0.6 A @ 200VAC
Inrush Current	30A	
Efficiency	80% typical	

CO-00AC Power Supply Output Specs

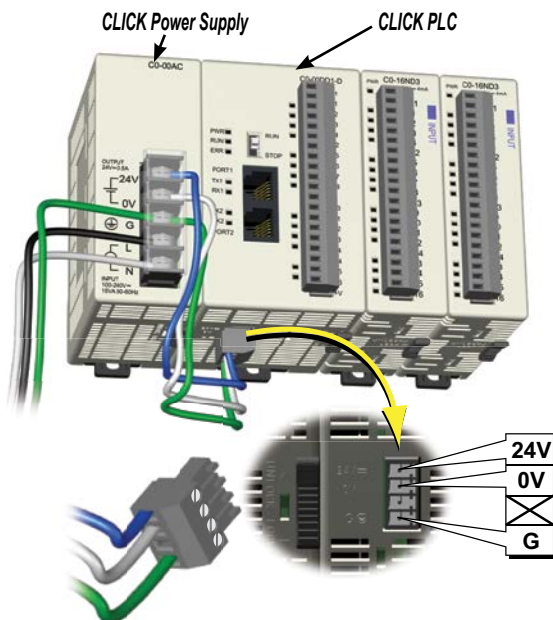
Part Number	CO-00AC	CO-01AC
Output Voltage Range	23–25 VDC	
Output Current	0.5 A	1.3 A
Ripple	200mV p-p max (0–55°C)	
Ripple Noise	300mV p-p max (0–55°C)	
Over Current Protection	@ 0.65 A (automatic recovery)	@ 1.6 A (automatic recovery)
Over Voltage Protection	@ 27.6 V (clamped by Zener diode)	
Start-up Time	1000ms max at rated input and load	
Hold-up Time	10ms minimum at 85VAC, I=max	

CO-00AC Power Supply General Specs

Part Number	CO-00AC	CO-01AC
Ambient Operating Temperature	32–131°F [0–55°C]	
Storage Temperature	–4–158°F [–20–70°C]	
Humidity	30–95%, non-condensing	
Vibration Resistance	JIS C60068-2-6, sine wave vibration	
Shock Resistance	JIS C60068-2-27	
Voltage Withstand		
Input-Output	1500VAC, 5mA cutoff current	
Input-Ground	1500VAC, 5mA cutoff current	
Output-Ground	500VAC, 5mA cutoff current	
Insulation Resistance		
Input-Output	10MΩ minimum, 500VDC	
Input-Ground	10MΩ minimum, 500VDC	
Output-Ground	5MΩ minimum, 500VDC	
Noise Immunity	FCC Class A, EN55022:1998 Class A	
Input/Output Interface	5P terminal block, Fujicon UF2362AX series or equivalent	
Agency Approvals	UL508, UL1604, EN61010-1 (IEC 1010-1), CAN/CSA E60079-15:02, JIS C0025	
Weight	5.3 oz [150g]	6.0 oz [170g]

PSP24-DC12-1 DC-DC Converter Specs

Input Voltage Range	9.5–18 VDC
Input Power (no load)	1.0 W max.
Startup Voltage	8.4 VDC
Undervoltage Shutdown	7.6 VDC
Output Voltage Range	24–28 VDC (adjustable)
Output Current	1.0 A
Short Circuit Protection	Current limited at 110% typical
Weight	7.5 oz (213g)



24VDC power is supplied to the PLC unit through wiring connected from the power supply output to the 4-pin 24VDC input connector located on the bottom of the PLC unit.



PSP24-DC12-1

Power Budgeting

Power Budgeting

There are two areas to be considered when determining the power required to operate a CLICK PLC system. The first area is the power required by the PLC, along with the internal logic side power that the CPU provides to its own I/O and any connected I/O modules that are powered through the PLC expansion port; plus any device, such as a **C-more** Micro-Graphic panel, that is powered through one of the communications ports.

The second area is the power required by all externally connected I/O devices. This should be viewed as the field side power required. The field side power is dependent on the voltage used for a particular input or output device as it relates to the wired I/O point, and the calculated load rating of the connected device.

It is strongly recommended that the power source for the logic side be separate from the power source for the field side to help eliminate possible electrical noise.

Power budgeting requires the calculation of the total current the 24VDC power source needs to provide to CLICK's logic side, and also a separate calculation of the total current required for all devices operating from the field side of the PLC system.

Refer to the Power Budgeting example shown on the following page. The table shows required current for a CLICK PLUS PLC, two I/O modules, and a **C-more** Micro. Use the total amperage values to select the properly sized power supply.



CLICK 24VDC Power Supply
C0-00AC or C0-01AC



Other 24VDC Power Supply
Example: PSP24-060S

Power Consumption for CLICK PLC Units

PLC Current Consumption (mA)		
Part Number	Power Budget 24VDC (logic side)	External 24VDC (field side)
Basic PLC Units		
<u>C0-00DD1-D</u>	120	60
<u>C0-00DD2-D</u>	120	0
<u>C0-00DR-D</u>		
<u>C0-00AR-D</u>		
Standard PLC Units		
<u>C0-01DD1-D</u>	140	60
<u>C0-01DD2-D</u>	140	0
<u>C0-01DR-D</u>		
<u>C0-01AR-D</u>		
Analog PLC Units		
<u>C0-02DD1-D</u>	140	60
<u>C0-02DD2-D</u>	140	0
<u>C0-02DR-D</u>		
Ethernet Basic PLC Units		
<u>C0-10DD1E-D</u>	120	60
<u>C0-10DD2E-D</u>	120	0
<u>C0-10DRE-D</u>		
<u>C0-10ARE-D</u>		
Ethernet Standard PLC Units		
<u>C0-11DD1E-D</u>	140	60
<u>C0-11DD2E-D</u>	140	0
<u>C0-11DRE-D</u>		
<u>C0-11ARE-D</u>		

PLC Current Consumption (mA)		
Part Number	Power Budget 24VDC (logic side)	External 24VDC (field side)
Ethernet Analog PLC Units		
<u>C0-12DD1E-D</u>	140	60
<u>C0-12DD2E-D</u>		
<u>C0-12DRE-D</u>	160	0
<u>C0-12ARE-D</u>		
<u>C0-12DD1E-1-D</u>	140	60
<u>C0-12DD2E-1-D</u>		
<u>C0-12DRE-1-D</u>	160	0
<u>C0-12ARE-1-D</u>		
<u>C0-12DD1E-2-D</u>	140	60
<u>C0-12DD2E-2-D</u>		
<u>C0-12DRE-2-D</u>	160	0
<u>C0-12ARE-2-D</u>		

Power Consumption for CLICK PLUS PLC Units

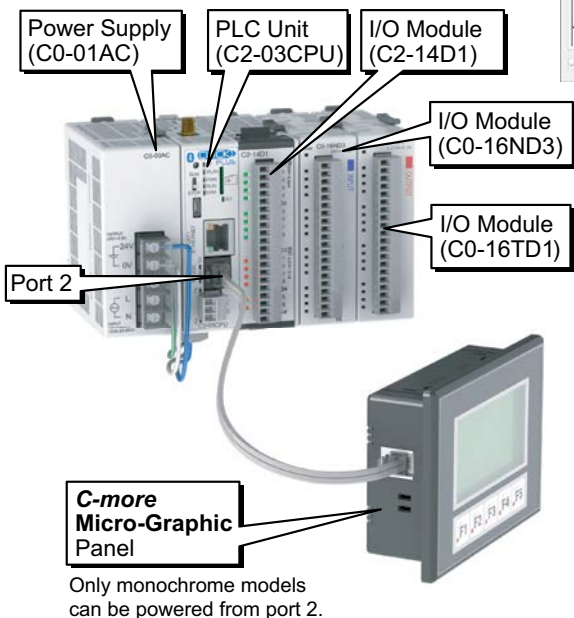
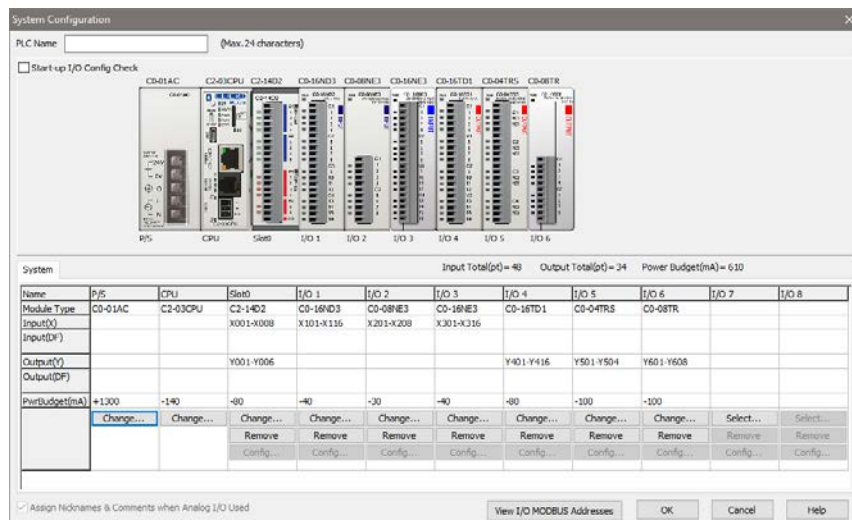
CLICK PLUS PLC and Option Slot Modules Current Consumption (mA)		
Part Number	Power Budget 24VDC (logic side)	External 24VDC (field side)
CLICK PLUS PLCs		
<u>C2-01CPU</u>	110	0
<u>C2-02CPU</u>	105	0
<u>C2-03CPU</u>	130	0
Option Slot I/O Modules		
<u>C2-14D1</u>	50	60
<u>C2-14D2</u>	50	0
<u>C2-14DR</u>	75	0
<u>C2-14AR</u>	75	0
<u>C2-08D1-4VC</u>	80	60
<u>C2-08D2-4VC</u>	80	0
<u>C2-08DR-4VC</u>	100	0
<u>C2-08AR-4VC</u>	100	0
<u>C2-08D1-6C</u>	80	60
<u>C2-08D2-6C</u>	80	0
<u>C2-08DR-6C</u>	100	0
<u>C2-08AR-6C</u>	100	0
<u>C2-08D1-6V</u>	80	60
<u>C2-08D2-6V</u>	80	0
<u>C2-08DR-6V</u>	100	0
<u>C2-08AR-6V</u>	100	0

Power Budgeting Using the

Power Consumption for CLICK Stackable I/O Modules

I/O Module Current Consumption (mA)		
Part Number	Power Budget 24VDC (logic side)	External 24VDC (field side)
Discrete Input Modules		
C0-08SIM	50	0
C0-08ND3	30	0
C0-08ND3-1	30	0
C0-16ND3	40	0
C0-08NE3	30	0
C0-16NE3	40	0
C0-08NA	30	0
Discrete Output Modules		
C0-08TD1	50	15
C0-08TD2	50	0
C0-16TD1	80	100
C0-16TD2	80	0
C0-08TA	80	0
C0-04TRS	100	0
C0-04TRS-10	120	0
C0-08TR	100	0
C0-08TR-3	90	0

I/O Module Current Consumption (continued) (mA)		
Part Number	Power Budget 24VDC (logic side)	External 24VDC (field side)
Discrete Combo I/O Modules		
C0-16CDD1	80	50
C0-16CDD2	80	0
C0-08CDR	80	0
Analog Input Modules		
C0-04AD-1	20	65
C0-04AD-2	23	65
C0-04RTD	25	0
C0-04THM	25	0
Analog Output Modules		
C0-04DA-1	20	145
C0-04DA-2	20	85
Analog Combo I/O Modules		
C0-4AD2DA-1	25	75
C0-4AD2DA-2	20	65
C-more Micro-Graphic Panel		
Monochrome only	90	0



Power Budgeting Example

Current Consumption (mA) Example		
Part Number	Power Budget 24VDC (logic side)	External 24VDC (field side)
C2-03CPU	130	0
C2-14D1	50	60
C0-16ND3	40	0
C0-16TD1	80	100
C-more Micro	90	0
Total:	390	160 *

* Add in calculated load of connected I/O devices.

CLICK Specifications

CLICK PLC Hardware/Software Compatibility

CLICK PLCs require a minimum software version of v2.50 for the PID function. The table below shows the most recent software and hardware versions required for the High-Speed input operation capability to be accessible.

CLICK PLC Features Software Compatibility							
CPU Type	Part Number	Minimum CLICK Software Version					
		Hardware	High-Speed Inputs	EtherNet/IP	PID	DHCP	
Basic	C0-00DD1-D	v1.00	N/A	N/A	N/A	N/A	
	C0-00DD2-D						
	C0-00DR-D						
	C0-00AR-D						
Standard	C0-01DD1-D	v1.20	N/A	N/A	N/A	N/A	
	C0-01DD2-D						
	C0-01DR-D						
	C0-01AR-D						
Analog	C0-02DD1-D (before SN 171208001)	v1.12	N/A	N/A	N/A	N/A	
	C0-02DD1-D (after SN 171208001)	v2.10					
	C0-02DD2-D (before SN 174018001)	v1.12					
	C0-02DD2-D (after SN 174018001)	v2.10					
	C0-02DR-D (before SN 173158001)	v1.12					
	C0-02DR-D (after SN 173158001)	v2.10					
Ethernet CPUs	Ethernet CPUs require v2.40 for EtherNet/IP communications						
Ethernet Basic	C0-10DD1E-D	v2.00	v2.30	v2.40	v2.50	v3.00	
	C0-10DD2E-D						
	C0-10DRE-D		N/A				
	C0-10ARE-D						
Ethernet Standard	C0-11DD1E-D	v2.00	v2.30	v2.40	v2.50	v3.00	
	C0-11DD2E-D						
	C0-11DRE-D		N/A				
	C0-11ARE-D						
Ethernet Analog	C0-12DD1E-D	v2.20	v2.30	v2.40	v2.50	v3.00	
	C0-12DD2E-D						
	C0-12DRE-D		N/A				
	C0-12ARE-D						
	C0-12DD1E-1-D		v2.30				
	C0-12DD2E-1-D						
	C0-12DRE-1-D		N/A				
	C0-12ARE-1-D						
	C0-12DD1E-2-D		v2.30				
	C0-12DD2E-2-D						
	C0-12DRE-2-D		N/A				
	C0-12ARE-2-D						
I/O Modules	C0-08NE3	v1.20	N/A	N/A	N/A	N/A	
	C0-16NE3						
	C0-04AD-1	v1.40					
	C0-04AD-2						
	C0-04DA-1						
	C0-04DA-2						
	C0-4AD2DA-1						
	C0-4AD2DA-2						
	C0-04RTD						
	C0-04THM						
	C0-08CDR						
	C0-16CDD1						
	C0-16CDD2						
	Other modules						v1.00