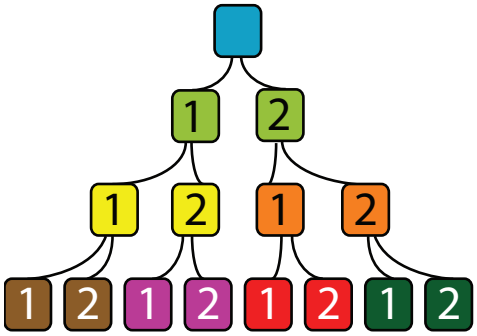
Branch PLC

Velocio's Branch PLC

The Branch PLC is a member of the Velocio's groundbreaking series of programmable logic controllers. These PLCs introduce revolutionary new concepts, capabilities, performance and ease of use features to the automation market. They constitute a generational leap over the staid products that have comprised the PLC world for years.

A key feature of the Velocio PLC line is distributed operation. By placing IO and optionally, program intelligence, right at every point of application, historical problems with accuracy, reliability, safety, installation cost, maintenance and others are radically reduced or eliminated.

The Branch PLC is the top of the tree for a distributed system. It contains the main system program and up to 30 points of IO. vLink communications ports on the Branch communicate autonomously with Branch Expansion PLCs for either expanded IO, or distributed operation. In a large, distributed processing system, the Branch is the main, supervisory controller in the system. Through a tree structure, one Branch PLC can act as the main controller for a system of up to 15 PLCs. These PLCs can be distributed in a variety of locations. They can act as expansion IO, or as a system of tightly integrated, distributed processing controllers.



Branch PLCs are programmable, using Velocio's vBuilder software. They connect to a PC using a standard USB communications cable and to Branch Expansion PLCs through vLink communications cables. Through a single USB communication link to a PC, an entire system of Velocio PLCs can be programmed, debugged and deployed.

Branch PLCs feature integrated local IO. Up to 12 digital inputs, 12 digital outputs and 6 analog inputs are available. In addition to basic input/output capabilities, the Branch can be configured for high speed digital pulse counting for either simple pulse or quadrature inputs. It can also be configured for high speed stepper motion pulse and direction control.

This PLC, which fits in a shirt pocket, is a building block of the most advanced, flexible, easiest to develop and deploy automation technology available anywhere.

Available Versions of the Branch PLC

Branch 11 :	6 digital in, 6 digital out, 2 vLink ports
Branch 22 :	12 digital in, 12 digital out, 2 vLink ports
Branch 221x :	12 DI, 12 DO, 6 Analog in (3 ranges), 2 vLink
Branch 1430 :	6 DI, 12 DO, serial, 2 vLink
Branch 1450 :	6 DI, 12 DO, 2 TC, serial, 2 vLink
Branch 1486 :	6DI, 1DO, 2TC, 4 AI (3 ranges), 2 AO, 2 vLink

Applications

- Machine control
- Process control
- Entire manufacturing line control
- Building automation
- Distributed system control
- Motion system control
- Robotics
- Machine to Machine applications

Features

- Up to 30 Inputs and Outputs (model # dependent)
  - Digital Inputs
  - Digital Outputs
  - Analog Inputs
  - Thermocouple inputs
  - Analog outputs
- Distributed IO Expansion
- Distributed Processing Platform
- Two vLink Expansion Communications ports
- vLink communications up to 100 meters (328 feet)
- USB connection to PC and other Host devices
- Smallest physical footprint of any PLC
- Software features at or beyond those of the most advanced PLCs and Programmable Automation Controllers (PACs)
- Program development via vBuilder
  - Graphical program development
  - Flow Chart Programming
  - Ladder Logic Programming
  - Distributed Processing
  - Integrated deployent and debug of distributed processing systems
  - Interactive, graphical full system debug functionality
  - Software reusablity

Benefits

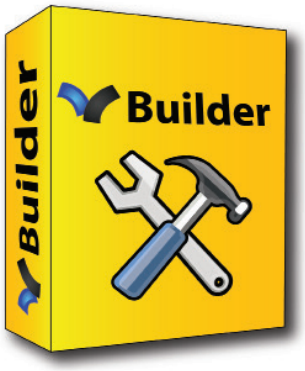
- Automatic communications between system modules
- Deployment of intelligence and IO at point of application
- Greatly enhanced and efficient development process
- Reduced systems cost
- Reduced development time
- Improved reliability
- Automatic machine to machine operations
- Total system deployment and debug

Flavors of Branch

There are a growing number of Branch PLCs. The units vary with respect to input/output (IO) configuration, number of ports and communications capabilities.

	Digital In	Digital Out	Analog In 0-5volt	Analog In 0-10volt	Analog In 0-20mAmp	Analog Out 16 bit	Therm In / Diff Analog In	RS232 / RS485
Branch 11	6	6						
Branch 22	12	12						
Branch 221v5	12	12	6					
Branch 221v10	12	12		6				
Branch 221c	12	12			6			
Branch 1430 NEW!	6	12						1
Branch 1450 NEW!	6	12					2	1
Branch 1486v5	6	12	4			2	2	1
Branch 1486v10	6	12		4		2	2	1
Branch 1486c	6	12			4	2	2	1

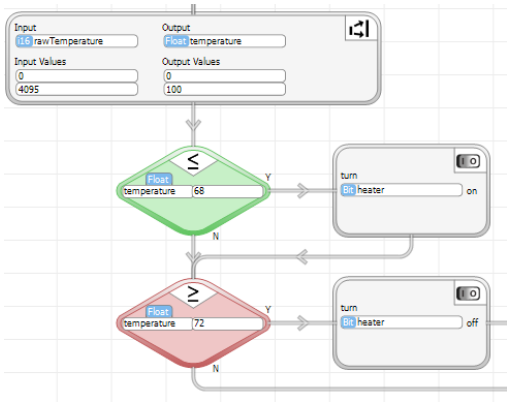
vBuilder Software



Like all Velocio PLCs, Branch can be custom programmed for your application's requirements, using Velocio Builder (vBuilder). vBuilder is an application that is distributed free of charge, for use in developing programs for Velocio PLCs.

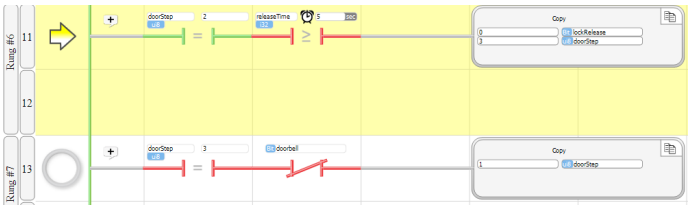
vBuilder is the most powerful, flexible, intuitive, easy to use graphical program development software available in the industry. That includes the packages from the industry titans, that will cost you hundreds to thousands of dollars. We're sure that you'll love it.

In vBuilder, you can develop applications using either Flow Chart, or traditional Ladder Logic programming.



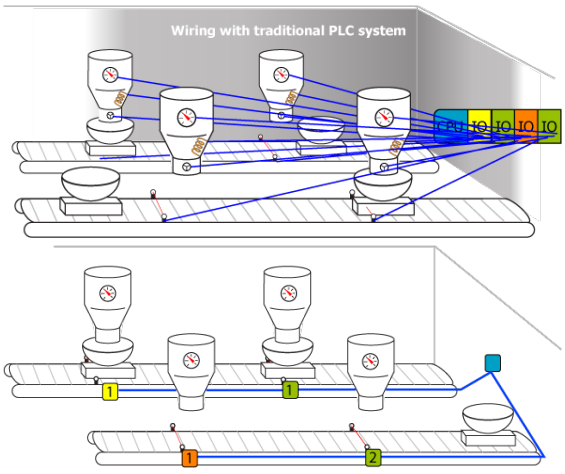
Some vBuilder features include :

- Flow Chart programming
- Ladder Logic programming
- True subroutines
- Object oriented graphical programming
- Distributed program operation
- Single point debug of local or distributed systems



There's so much more. Download vBuilder from Velocio.net to see for yourself. You'll notice very quickly that you can develop any program that you can logically define, in a fraction of the time required using other approaches, with easy to use graphical tools - and its fun!

Distributed IO



In typical control system applications, physical inputs and outputs are located at physically diverse points, commonly in clusters. Traditional PLCs require you to string wire from these distributed locations back to a centralized PLC. This leads to high costs in wiring material and labor. It also potentially results in degraded signal quality, reduced reliability and higher maintenance costs.

Velocio PLCs are designed to allow you to place the IO at the point of application. Each module is linked, via high speed vLink communications. IO modules can be placed anywhere from a few feet apart to 100 meters apart.

The Velocio PLC program treats this distributed IO, just like its local IO. The speed of communication between devices means that sensor status and device activation takes place nearly instantaneously. Wiring time and expense are minimized, while reliability improves and maintenance is reduced.

Distributed Processing

Traditional distributed processing is a very difficult undertaking. Sure, the control devices may have communications ports. But the process of configuring the devices, designing the communications, debugging and deploying is something that can take a very capable system engineer many days to weeks.

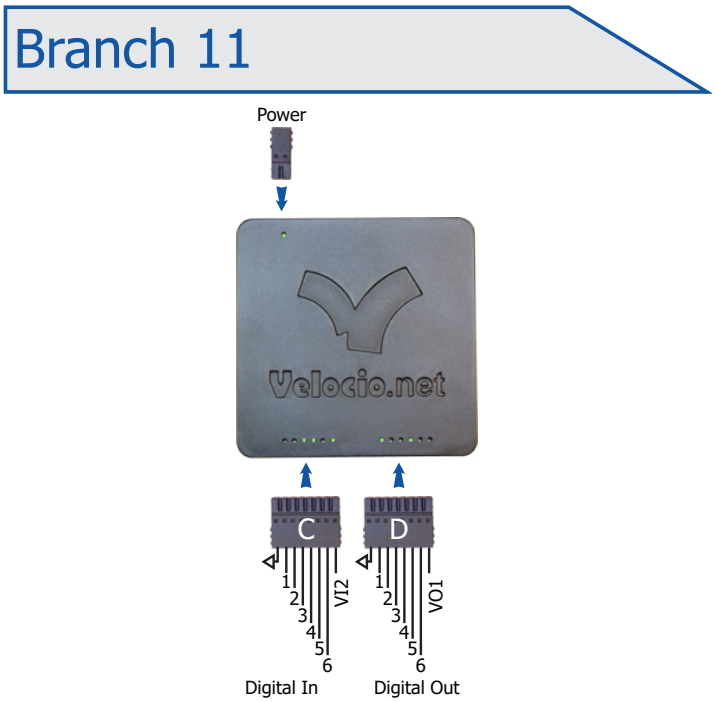
Velocio PLCs have been designed for distributed processing from the get go. Developing a distributed processing system, with interlinked, independently operating PLCs is no more involved that writing a subroutine for a local PLC. In fact it is directly analogous to writing a subroutine. Define which PLC device each program gets deployed into, define the data that is passed back and forth, then push the program button. The entire system will be programmed. You need not concern yourself with the details of how data is communicated - its done autonomously over vLink.

Debugging the distributed system is also much simpler than with other such systems. With vBuilder, the entire system's operation can be monitored from one PC. All debug operations, including breakpoints and single stepping can be selectively employed on any device in the system in real time.

Branch 11

The Branch 11 is the lowest IO count, least expensive member of the family. In addition to basic digital inputs and outputs, it is designed for motion control, PWM outputs, and high speed pulse counting, as well as vLink exapnsion.

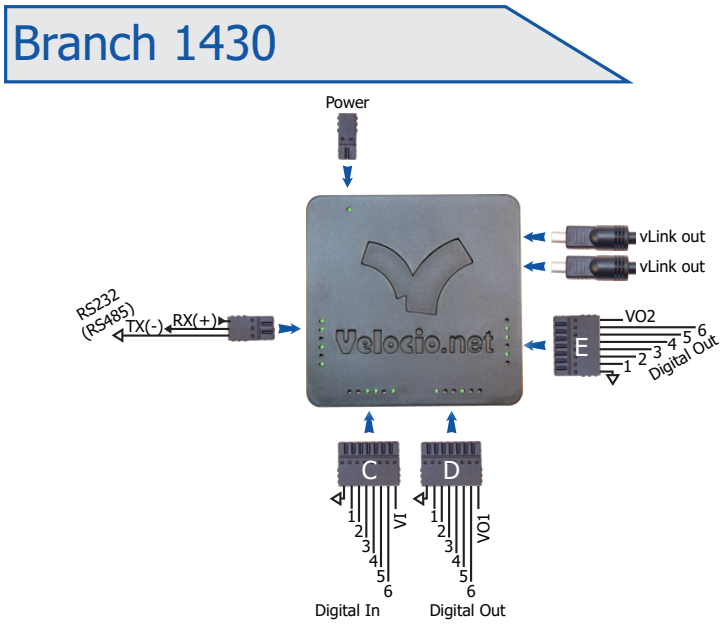
- 6 Digital Inputs
  - Protected, 3030VDC
  - High speed pulse counting capability
- 6 Digital Outputs
  - Sinking transistor outputs
  - Step and direction motion control enabled (3 maximum)
  - PWM capable on all outputs
- USB programming port
  - USB port Modbus RTu slave enabled



Branch 1430

The Branch 1430 includes IO interfaces for 6 digital inputs, 12 digital outputs and a serial port that is configurable as either RS232 or RS485.

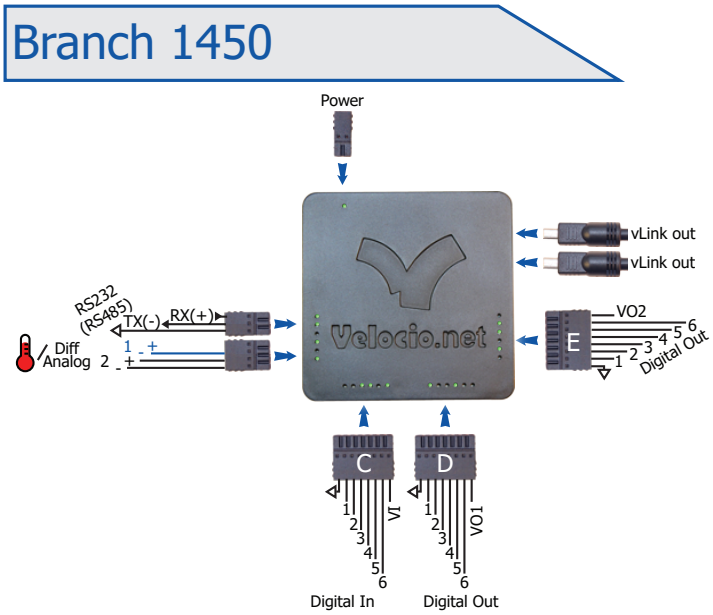
- 6 Digital Inputs
  - Protected, 3030VDC
  - High speed pulse counting capability
- 12 Digital Outputs
  - Sinking transistor outputs
  - Step and direction motion control enabled (3 maximum)
  - PWM capable on all outputs
- Serial port configurable as RS232 or RS485
- USB programming port
  - USB port Modbus RTu slave enabled



Branch 1450

The Branch 1450 includes IO interfaces for 6 digital inputs, 12 digital outputs, 2 thermocouple/differential voltage inputs and a serial port that is configurable as either RS232 or RS485.

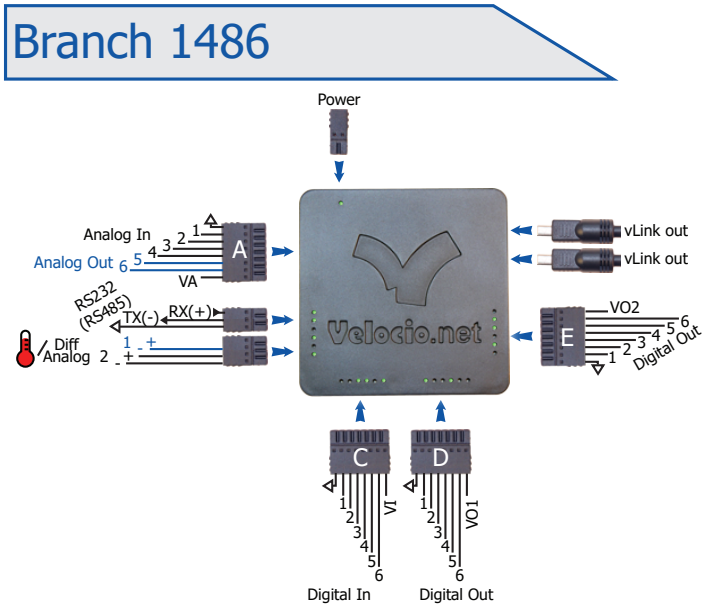
- 6 Digital Inputs
  - Protected, 3030VDC
  - High speed pulse counting capability
- 12 Digital Outputs
  - Sinking transistor outputs
  - Step and direction motion control enabled (3 maximum)
  - PWM capable on all outputs
- 2 thermocouple/differential voltage inputs
  - J, K, T of N thermocouple
  - 16 bit voltage input selectable for +/-0.256V, 0.512V, 1.024V and 2.048V ranges
- Serial port configurable as RS232 or RS485
- USB programming port
  - USB port Modbus RTu slave enabled



Branch 1486

The Branch 1486 includes IO interfaces for 6 digital inputs, 12 digital outputs, 2 thermocouple/differential voltage inputs, 4 analog inputs, 2 analog outputs and a serial port that is configurable as either RS232 or RS485.

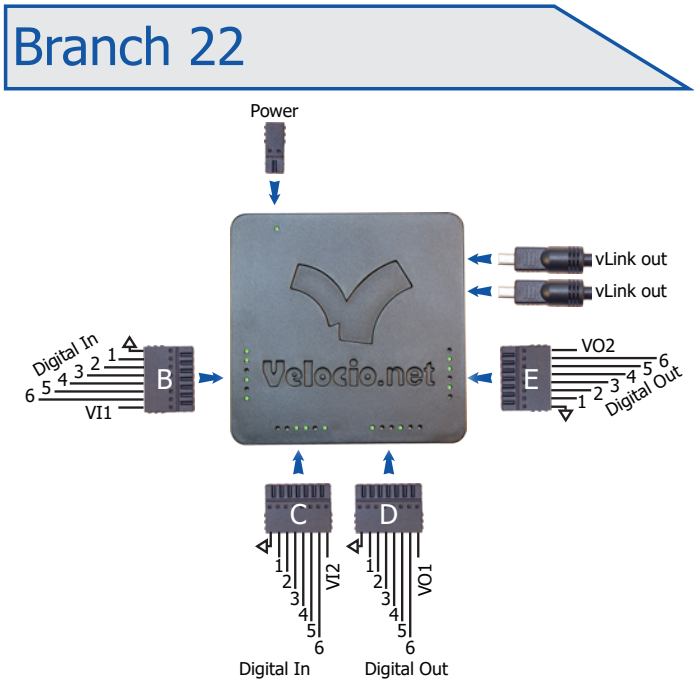
- 6 Digital Inputs
  - Protected, 3030VDC
  - High speed pulse counting capability
- 12 Digital Outputs
  - Sinking transistor outputs
  - Step and direction motion control enabled (3 maximum)
  - PWM capable on all outputs
- 2 thermocouple/differential voltage inputs
  - J, K, T of N thermocouple
  - 16 bit voltage input selectable for +/-0.256V, 0.512V, 1.024V and 2.048V ranges
- 4 Analog inputs, 12 bit resolution
  - Branch 1486v5 : 0-5VDC analog inputs
  - Branch 1486v10 : 0-10VDC analog inputs
  - Branch 1486c : 0-20mA analog inputs
- 2 Analog outputs
  - 0-5V or 0-10V (selectable using vBuilder)
  - 16 bit resolution
- Serial port configurable as RS232 or RS485
- USB programming port
  - USB port Modbus RTu slave enabled



Branch 22

The Branch 22 provides 12 digital inputs and 12 digital outputs. In addition to basic digital inputs and outputs, it is designed for motion control, PWM outputs, and high speed pulse counting, as well as vLink exapnsion.

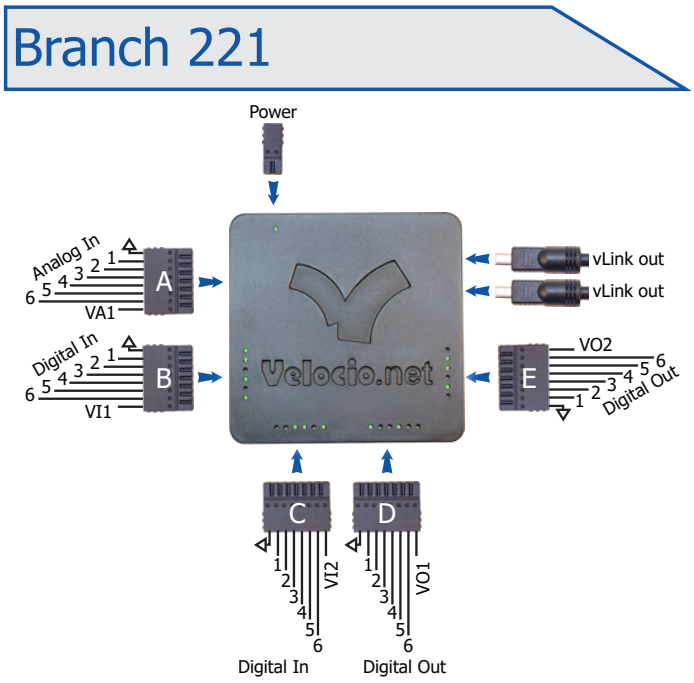
- 12 Digital Inputs
  - Protected, 3030VDC
  - High speed pulse counting capability
- 12 Digital Outputs
  - Sinking transistor outputs
  - Step and direction motion control enabled (3 maximum)
  - PWM capable on all outputs
- USB programming port
  - USB port Modbus RTu slave enabled



Branch 221

The Branch 22 provides 12 digital inputs and 12 digital outputs. In addition to basic digital inputs and outputs, it is designed for motion control, PWM outputs, and high speed pulse counting, as well as vLink exapnsion.

- 12 Digital Inputs
  - Protected, 3030VDC
  - High speed pulse counting capability
- 12 Digital Outputs
  - Sinking transistor outputs
  - Step and direction motion control enabled (3 maximum)
  - PWM capable on all outputs
- 6 Analog inputs, 12 bit resolution
  - Branch 221v5 : 0-5VDC analog inputs
  - Branch 221v10 : 0-10VDC analog inputs
  - Branch 221c : 0-20mA analog inputs
- USB programming port
  - USB port Modbus RTu slave enabled

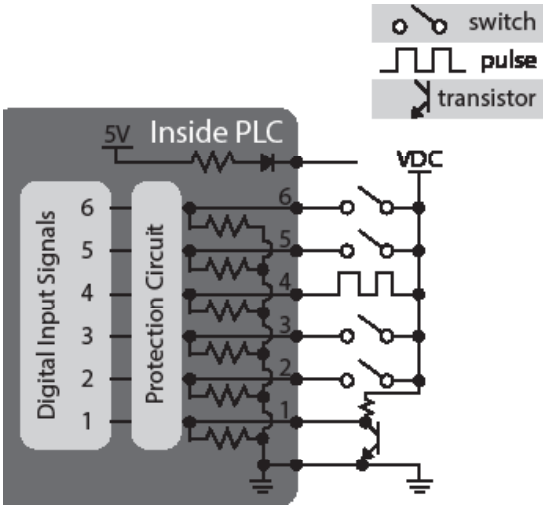


◊ Digital Inputs :

All Branch PLCs accept some number of digital inputs. Digital inputs sense binary status, such as on/off, switch open/closed, etc. The Ace PLC can interface any DC voltage signal between 3 and 30VDC. Typical system designs utilize 5V, 12V or 24VDC power supplies, which are all within the Ace's signal range.

Any connection to DC voltage between 3 and 30VDC is sensed as a '1'. Any connection to ground (or voltage below 0.8VDC) or an open connection is sensed as '0'. The ground reference of the signal must be connected to the ground terminal pin next to signal 1, or to the PLC's input power ground.

The figure on the right shows a variety of typical digital input signals that may be connected to Ace digital inputs. Some of the more common ones include :



- Switches (this could be mechanical switches, buttons, limit switches, etc.)
  - Connect one side to positive DC power (from a supply whose ground is connected to the PLC ground)
  - Connect the other side of the switch to the digital input
- Transistor signal
  - For transistor signals that supply voltage when on : connect sensor output to digital input
  - For transistor signals that switch to ground when on : connect to sensor output to digital inputs & if input device does not pull high when inactive, also pull up to positive voltage through a pull up resistor
- Encoder signals
  - Encoders will fall into one of the transistor signal categories listed above
- Logic level signals
  - Make sure that the signal's ground reference is connected to the PLC ground. Connect of input.
  - Make sure that the signal switches high and low.

The last pin on each digital input port connector provides a voltage (connected to the 5V power input, through a 10 ohm resistor and a diode) which is used by the Optocouple Input Terminal modules. It can also be used to supply "wetting voltage" to dry contact inputs.

Internally, as part of the protection circuit, each digital input is pulled to ground through a 10K ohm resistor. This pull down resistor ensures that the digital input shows up as inactive when nothing is connected or the connection just sources voltage when it is active.

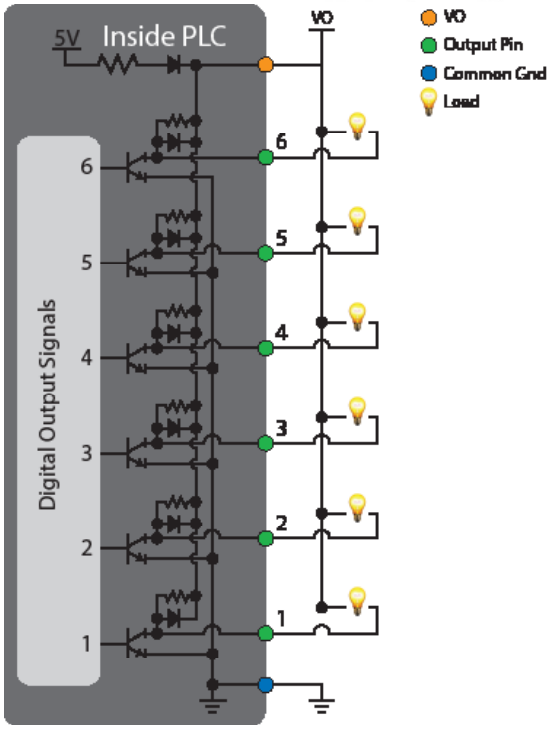
Do not connect external power to the voltage pin (pin 8) on the digital input port.

Branch digital inputs (and the Branch CPU) are very fast. For a small program, the logic scan and input scan can occur 5 times per millisecond. At this rate, mechanical contact bounce can signal the program that an input is changing rapidly - which can be a problem. To alleviate this situation, vBuilder has an option to allow you to set a debounce time on digital inputs. A debounced digital input will not report a change of state until that change has been continuous for the set debounce time. Note that debounce does not apply to inputs configured as high speed pulse counter inputs.

Using vBuilder, one high speed pulse counter can be configured for basic high speed pulse counting (one digital input), or quadrature pulse counting (two digital inputs). The same signal level requirements apply, as listed above.

For digital inputs that are AC signals, the Branch's digital input ports can be connected to Velocio Optocoupled Input Terminal Block modules. These modules interface 24VAC or 120VAC signals. A cable, supplied with each terminal block module is then connected to the Ace digital input port. The Optocoupler Input Terminal Block modules convert the AC signals to the proper DC levels to the PLC.

◊ Digital Outputs :



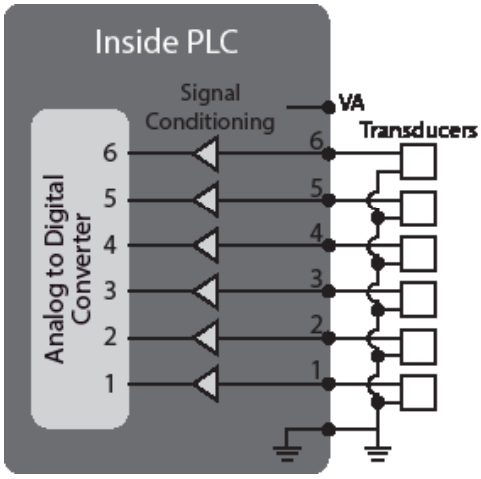
All Branch PLCs have some number of digital outputs. Branch digital outputs are sinking transistor outputs - which means that they provide the ground connection turn on a load. When switched on under program control, they complete the circuit to turn on any connected DC device up to 30VDC and 300mA.

Each ouput includes diode snubber protection, for inductive load (solenoids, relays, etc.) protection. The supply voltage, up to 30VDC, which is connected to the load devices, must be connected to the VO terminal pin, next to output 6 of the output port, to enable this protection. All loads connected to a digital output port should be connected to the same DC supply. The load power supply ground must be connected to the ground (next to signal 1) of the output port.

Each output is connected, through a 33K ohm resistor to the VO terminal pin (next to output 6). This acts as a weak pull up. When the output is off (logic state 0), the output will be pulled up to the voltage at the VO terminal. If no power supply connection is made to the VO terminal, the voltage at the VO terminal will come through a 10 ohm resistor and an isolation diode, resulting in a voltage approximately 0.7V below the 5V supply to the PLC. This is enough to allow the PLC outputs to directly interface TTL circuits. If voltage is connected from an external source to the VO terminal, inactive outputs will pull up to the external source voltage.

If AC power, or higher power DC needs to be switched, the Ace's digital output ports can be connected to a Velocio Relay Terminal Block module, through a short standard cable, supplied with the module. With a Relay module, up to 250VAC and 5 Amps can be switched under program control. The cable diagram connection to the PLC digital output port pluggable connector is illustrated in the Relay Terminal Block module documentation.

◊ Analog Inputs :



Branch PLCs are available with some number of general analog inputs. Ace PLC analog input interfaces are available for either 0-5VDC, 0-10VDC or 0-20mA.

Analog inputs are normally used to connect to transducer outputs. Such transducers measure some physical parameter, such as pressure, temperature, liquid level, position, pH level, or other such continuously variable measurement. The transducer signal output should be connected to a signal input on the Ace analog port and the transducer return or ground reference line must be connected to the PLC ground, next to signal 1 (or otherwise connected to the PLC's ground).

Branch PLCs with current input analog input ports (part number ending in 'c') should be used for analog current signals between 0 and 20 mA. The two most common type of current signals are 4-20 mA and 0-20 mA.

Full range analog signals will convert to a value between 0 and 4095 (12 bits). For 4-20mA inputs, the converted value will be between 820 and 4095. The Scale function in vBuilder can be used to automatically convert the signal value to meaningful data.

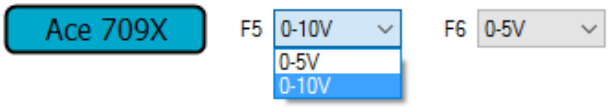
For PLCs that have a full 8 position port dedicated to analog inputs, the pin next to the sixth input is connected to the PLC's internal 5V, through a 10 ohm resistor and a diode. This is provided to power a future analog input simulator. It servers no other purpose and should remain unconnected for application use. Analog input ports that do not occupy the full 8 position port do not have this connection.

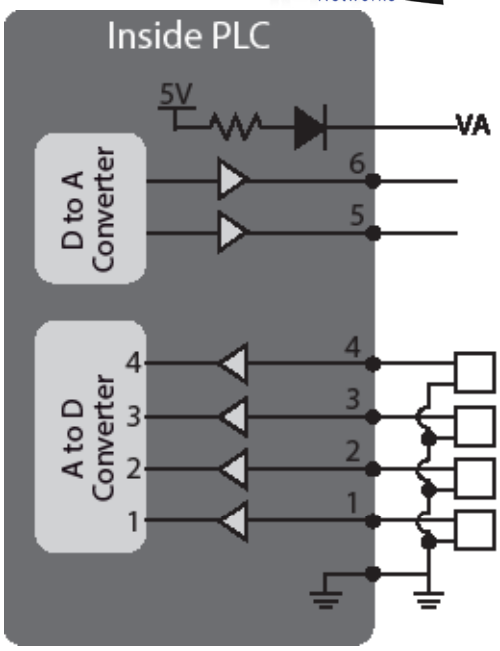
◊ Combination Analog Inputs and Analog Outputs

Certain Branch PLCs have a single connector with both analog inputs and outputs. The connections are as shown on the diagram at the right.

The first few signals on the port are analog inputs. They are 12 bit analogs, described in the analog input description. Typically, there are either 3 or 4 analog inputs in a combination port

The last signals on a combination port are analog outputs. For the Branch 1486 these are 16 bit resolution outputs, which can be individually configured, using vBuilder for either 0-5V or 0-10V operation, as shown below.





◊ Thermocouple/16 bit Differential Low Voltage Analog Inputs

Several Branch PLC's include interfaces that are configurable for either providing thermocouple interfaces or serving as analog inputs for differential analog signals. These signal inputs can be individually configured, in vBuilder, for either thermocouple or differential voltage ranges.

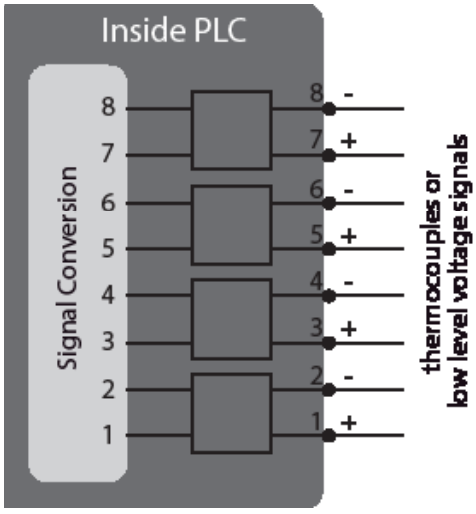
For interfacing to thermocouples, these inputs can be configured for J, K, T or N type thermocouples. Connect each thermocouple to one of the four wire pairs shown in the diagram on the right. The negative (red) wire should be connected to the negative input (indicated by a '-' sign on the diagram). The positive wire should be connected to the positive connection.

Each differential input can also be used to measure low level differential voltage signals. The following ranges are available :

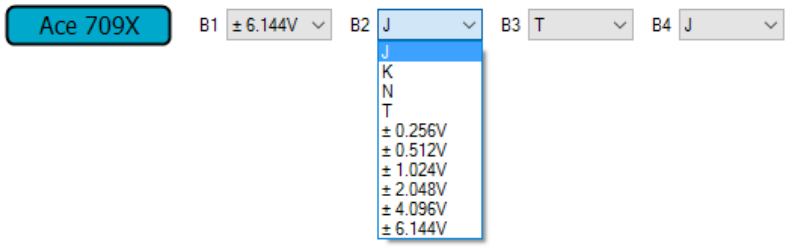
- +/- 0.256V
- +/- 0.512V
- +/- 1.024V
- +/- 2.048V

The vBuilder Setup window for the thermocouple/ differential analog configuration is shown on the right.

In operation, the signal is converted to a floating point value. That value is either temperature, in degrees Celcius, or volts.



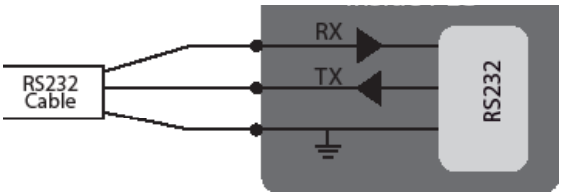
Thermocouple / Differential Input Setup



◊ RS232 and RS232/485 Ports :

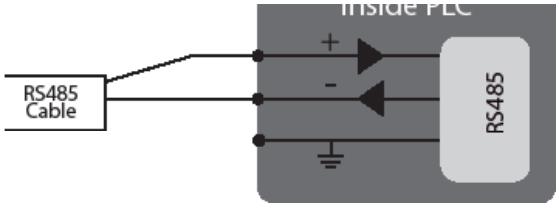
Certain Branch PLCs have RS232 ports or configurable RS232/485 ports. RS232 ports are commonly used for interfacing hardware HMI panels and other devices through Modbus RTU communications. They are also commonly used to interface cellular transceivers for internet of things applications and can be used in Custom communications mode to communicate to any device that has an RS232 port.

RS485 ports are commonly used in multi unit systems and for longer distance communictions.



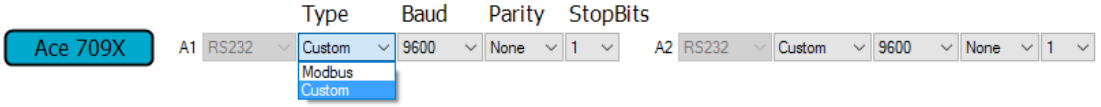
Branch PLC RS232 ports have three pin connectors. The illustration on the right shows the connections.

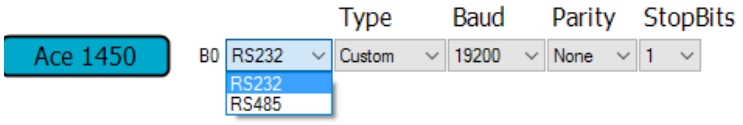
- Signal ground
- PLC transmit (must be connected to the receive pin of the connected device)
- PLC receive (must be connected to the transmit pin of the connected device)



Some Branch PLCs have serial ports that can be configured as either RS232 or RS485. When configured as RS232, the connections are identical to the connections shown for the dedicated RS232 ports. If the port is configured for RS485, the two connections used are the + (or A), on the same pin as the RS232's RX and the - (or B), on the middle pin or RS232's TX pin. The ground can be connected to the cable shield. However, the shield should only be connected at one end of the cable.

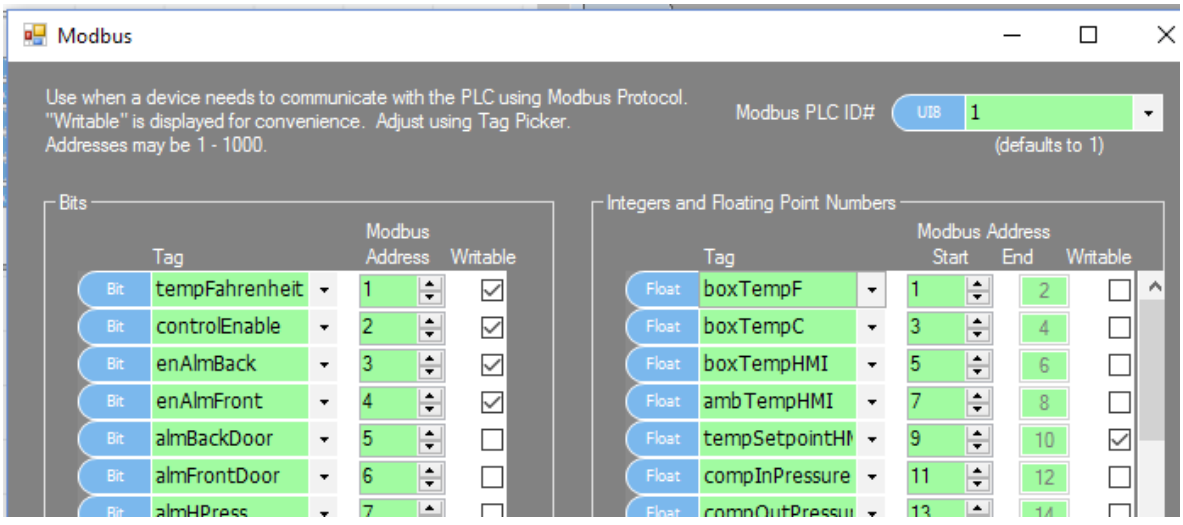
Serial ports can be configured by vBuilder for either Modbus RTU slave or Custom communications operation. Each port can also the configured for a variety of baud rates, the number of stop bits and parity. Serial ports that can be configured for either RS232 or RS485 have another configuration selection for that purpose.



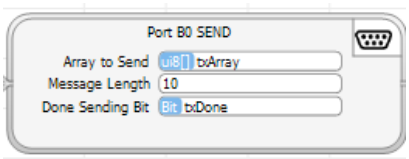


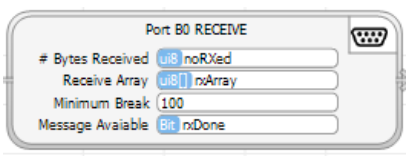
All serial ports support Modbus RTU protocol The PLCs are slave devices. The default device address is 1, but can be configured to any desired address via vBuilder.

Modbus communications is autonomous and simply requires set up of address mapping, using vBuilder, as shown on the right. Once set up and connected, communications occurs automatically.



When configured for Custom communications, the port will send and receive character (ui8) arrays, under program control, through the use of program blocks like those shown on the right.

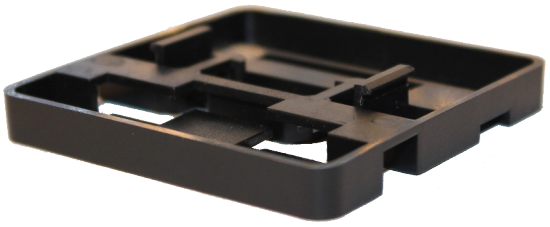




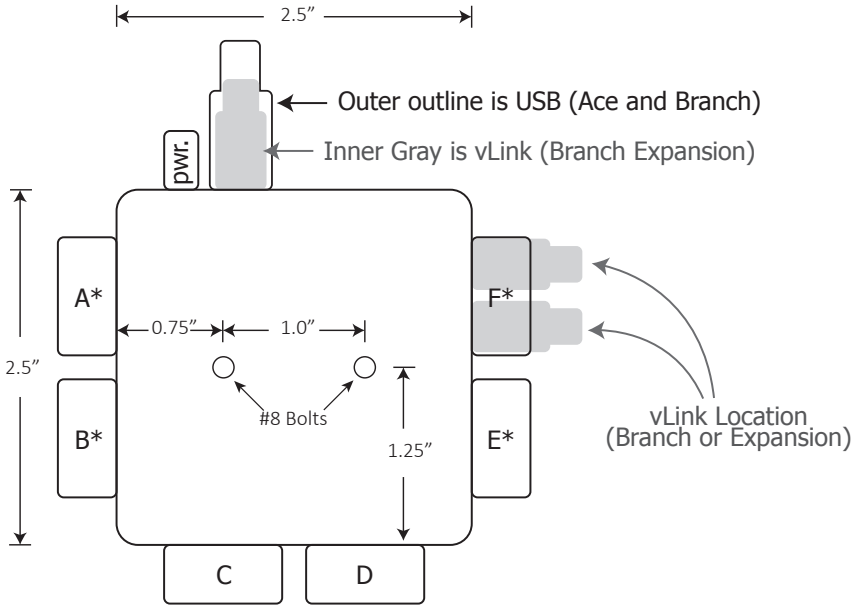
Mounting Options

Each Velocio PLC comes with a double sided adhesive pad for attaching to painted metals, plastics or glass. Using this method of attachment allows you to install the PLC in very tight and unusual environments as well as place them in typical electrical control panels. The adhesive is very strong and will provide a solid permanant attachment, unless extreme pressure is applied to break the seal.

Alternatively, Velocio PLCs are designed to add an optional vMount DIN rail mounting adapter. The vMount adapter snaps onto the bottom side of the PLC. It can then be snapped onto a standard 35mm DIN rail, or can slide onto a pair of properly spaced screws.

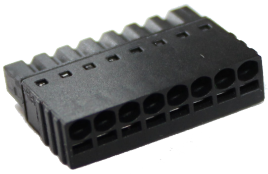


DIN rail mounting is illustrated on the right. The necessary hole pattern for screw mounting is shown below.



Wire Connections to the PLC Pluggable Terminal Blocks

Branch units come with pluggable terminal blocks, like the one shown on the on the right. Connect your wires using the larger circular holes on the top row of the orientation shown.



Looking at the connector, in the orientation shown from left to right, the eight wire positions are ground, six signal positions 1 through 6, and either a no connect (analog), VDC (output) or 5VDC from the 5V power input to the PLC (input).

You simply need to strip the insulation back about 1/8 inch, insert each wire into the proper round connector hole and push the wire in. It should push in very easily and lock in place. You should not be able to pull the wire back out.

To insert very finely stranded wire, insert the blade of a Velocio connector tool (screwdriver) in the rectangular hole directly below the connection hole which you wish to insert your wire. The screwdriver blade should be horizontal (in line with the long dimension of the rectangular hole). This will open the spring capture connection. Simply push your wire in, then remove the blade. If you pull the wire, it should be captured in place and will not come out.

To remove any wire from the connector, use the Velocio screwdriver connector tool. Push the blade into the rectangular slot below the wire to open the spring clamp and release the wire. Gently pull the wire out, then remove to blade.

Connecting to Expansion Units

Connecting the Branch to a Branch Expansion unit is a very simple process. If the required connection distance is 6 feet or less, it simply involves plugging a standard vLink cable into one of the two vLink output ports on the Branch and the other end of the cable into the vLink input port of the Expansion unit. vLink cables come in either two or six foot length. Each cable has a vLink connectors on each end, that look as pictured on the right. The cable connections are identical on both ends. The cable can be connected either way.

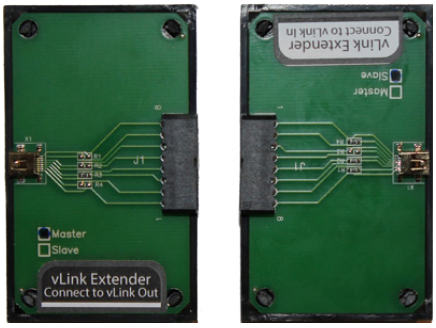
vLink port 1 is located closest to digital output port E. vLink port 2 is furthest from digital output port E.

A vLink connection from a Branch to a Branch Expansion is shown on the right.

If the required connection distance is greater than 6 feet, the process is not much more complex. You will need a vLink cable for each end of the connection, a pair of vLink Extenders, and CAT5e cable of the length required to span between to two devices. This length can be up to 100 meters (328 feet).

A pair of vLink Extenders is pictured on the right. The Extender labeled vLink Out (black label) connects to the vLink cable that is plugged into the Branch. The vLink In (white label) connects to the vLink cable plugged into the Branch Expansion's vLink input port.

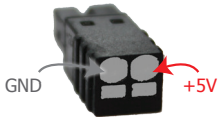
Each vLink Extender has an 8 position pluggable terminal block that is the same as used for PLC IO. Instructions for inserting the CAT5e cable in the terminal plugs is included with the vLink Extender pairs.



A completed vLink extension is shown in the picture on the right.

Connecting Power

Power to the Branch PLC must be provided via a two position pluggable connector, included with the Branch unit. To connect power, insert the 5VDC and ground connections from a power supply into the plug, as shown in the figure below. When plugged into the PLC's power connector socket, the +5VDC connection is to the right, closest to the corner..



Specifications

Hardware Specifications

Power :
- Voltage 4.75 - 5.5VDC
- current 300mA maximum
  < 100mA typical

Digital Inputs :
- Type : DC voltage input
- Input range : 3 to 30 VDC
- Internal pull down to ground : 10K ohms
- Input low (or 0) signal : 0 to 0.8V, or open connection
- Input high (or 1) siganl : 2.5 to 30VDC
- Pulse counter input frequency :
  up to 250 KHz (maximum)
- Program selectable debounce 0 to 255 milliseconds

Digital Outputs :
- Type : Sinking transistor
- Voltage range : 3 to 30VDC
- Current : 300 mA maximum
- Motion output pulse frequency
  0 to 250 KHz (maximum)

Analog Inputs :
- Type : v5 = 0 to 5VDC:
  v10 = 0 to 10VDC
  c = 0 to 20 mA
- resolution : 12 bit

Analog Outputs :
- Types : selectable ; 0-5VDC, 0-10VDC
- Resolution : 16 bit

Thermocouple/Differential Voltage Inputs :
- Types : selectable ; J, K, T or N or -
  +/-0.256V
  +/-0.512V
  +/-1.024V
  +/-2/048V
- Output value : floating point value in C or V

Communications :

- Upstream : USB Device
  mini USB connector
- Downstream : Two vLink connectors
- Maximum Expansion Levels : 3
- Maximum number of PLCs in system : 15
- RS232 : 3 wire (TX, RX and ground)
- RS485 : 2 wire
  baud rates, parity, stop bits selectable
  baud rates : 9600 - 115,200 baud

Physical Dimensions :

2.5"H x 2.5"W x 0.5" deep

Environmental :

- Operating temperature : -40 to +85C
- Humidity : 0 to 95% (non-condensing)

Software Specifications

Application Program Limits (in Branch PLC*)

Program Memory :		34K Words
Maximum rungs or function blocks		4K
Maximum # Subroutines		68
Maximum Tagnames		950
Main Program data memory		
Bits		2,048
unsigned 8 bit integers		512
unsigned 16 bit integers		512
signed 16 bit integers		512
signed 32 bit integers		256
floating point numbers		256
Object Memory (used for subroutine data)		
object words		4,096
object bits	up to	65,536
object 8 bit integers	up to	8,192
object signed 16 bit	up to	4,096
object unsigned 16 bit	up to	4,096
object signed 32 bit	up to	2,048
object floating point	up to	2,048
Maximum # objects		292
Maximum # PWM outputs		all digital outputs
Maximum # Stepper Motion Controls :		3

*(Additional Program resources provided with each Branch Expansion configured for an Embedded Subroutine)

Terminal Block Connections

Terminal type	Socket connectors and Spring cage capture plug
Terminal spacing :	2.50 mm
Wire AWG	20 to 26 AWG*

* best wire fit is with 22 or 24 AWG