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Lookout*Direct* Object Descriptions

This appendix provides descriptions of the Lookout*Direct* system objects and Lookout*Direct* driver objects.

You build Lookout*Direct* processes by creating Lookout*Direct* objects and by making select connections. Lookout*Direct* has two kinds of objects: Lookout*Direct* system objects, which you use for control, monitoring, data analysis, and data presentation, and Lookout*Direct* driver objects, which you use to connect to hardware, such as PLCs (Programmable Logic Controllers), RTUs (Remote Terminal Units), computer boards, and other hardware.

Lookout*Direct* System Objects

The following table lists the Lookout*Direct* system objects, along with their categories and a description of what each one does.

Table A-1. Lookout*Direct* System Objects

Object Class	Category	Description
Accumulator	Calculation, Control	Accumulate a running total by adding a sampled value to the previous total each time a sample trigger fires. A reset trigger is also available.
Alarm	Logging	Define specific alarm conditions that can trigger alarms via complex conditions, or as a result of numeric inputs going out of range or based on rate of change. Attach audible (.wav) files to these alarms that play back whenever the alarm conditions is triggered.
Animator	Display	Dynamically animate graphics files through any combination of horizontal and vertical motion, resizing, visibility, and color changes. Play consecutive filmstrip images from a bitmap to simulate complex motions on the screen.

Table A-1. LookoutDirect System Objects (Continued)

Object Class	Category	Description
Average	Calculation, Control	Calculate the average of a variable input over time. Optionally control when averaging is active via the Enable input, and reset the average to the current input via the Reset input. The results of up to 35 previous averages are available, and the current average is updated approximately once per second.
Counter	Control, Logging	Count and record the number of times a logical signal turns on. Optionally reset the count with the Reset input. Maximum count is approximately 2^{52} .
DataTable	Control, Networking	Multiplex multiple data sets into a single control panel by allowing the operator to alter the table cursor setting. Import and export entire tables of data between other applications via DDE and NetDDE. A DataTable consists of a matrix of cells arranged into rows and columns.
DdeLink	Networking	Import a single live value into LookoutDirect from another application via DDE or NetDDE.
DdeTable	Networking	Import a table of values into LookoutDirect from another application via DDE or NetDDE. DdeTable is a subset of the DataTable object class which allows the bidirectional flow of DDE and NetDDE data.
DelayOff	Control, Timers	Introduce a variable time delay between the time the input signal turns off and this timer turns off.
DelayOn	Control, Timers	Introduce a variable time delay between the time the input signal turns on and this timer turns on.
Derivative	Calculation, Control	Calculate the rate of change of a numeric signal, specifying the time unit.
DialGauge	Display	Display a numeric signal as a sweeping dial. Specify the starting position and angle of sweep.
ElapsedTime	Control, Logging, Timers	Calculate and record the cumulative elapsed time that a particular signal has been on. Optionally use the Reset input to reset the elapsed time at any time.
Event	Logging, Monitoring	Permanently record the occurrence a particular event to the event log.
Flipflop	Control	Change the state of this object from on to off, or from off to on each time the input signal goes high.

Table A-1. LookoutDirect System Objects (Continued)

Object Class	Category	Description
Gauge	Display	Display a numeric value as a digital value or as a bar graph, and change the color of the bar or digits based on any set of conditions.
HyperTrend	Display, Logging	Display and peruse historical data as a moving chart, and zoom in on data of interest or search the Citadel historical database for maxima, minima, and other points of interest. Scroll back in time, or leap to any specific date and time instantly.
Integral	Calculation, Control	Totalize a numeric input signal that represents a rate with respect to time, specifying the time unit. Totalizing the flow based on a measured flow rate is a typical use of the Integral.
Interval	Control, Timers	Introduce a variable time delay between the time the input signal turns on and this timer turns off. The timer turns on immediately when the input turns on, and remains on for the timer duration or until the input signal goes low.
L3OPCClient	Obsolete	Obsolete LookoutDirect OPC client. Use OPC client version 4.0 instead. This class is included for compatibility.
L3Pot	Obsolete	A LookoutDirect 3.8-style potentiometer to track and/or alter the value of a numeric variable. A Pot can be displayed on a panel as a slider, rotating knob, or digital display/input. This class is included for backward compatibility with LookoutDirect 3.xx.
L3Pushbutton	Obsolete	A LookoutDirect 3.8-style push button to navigate between control panels within LookoutDirect, or to initiate any other action, such as executing an external application, or latching a pump on or off. This class is included for backward compatibility with LookoutDirect 3.xx.
L3Switch	Obsolete	A LookoutDirect 3.8-style toggle switch to track and/or alter the value of a logical variable. A Switch can be displayed on a panel in a variety of ways. This class is included for backward compatibility with LookoutDirect 3.xx.

Table A-1. LookoutDirect System Objects (Continued)

Object Class	Category	Description
L3TextEntry	Obsolete	A LookoutDirect 3.8-style text-entry object to track and modify a text value via a control panel, using either the computer keyboard or a keyboard display on the screen. This class is included for backward compatibility with LookoutDirect 3.xx.
LatchGate	Control	Latch the output of this object on or off based on whichever of two input signals last went high.
Loader	Control	Load or unload a process file when input goes high.
Maximum	Calculation, Control	Calculate the maximum of a variable input over time. Optionally control when maximum monitoring is active via the Enable input, and reset the maximum to the current value via the Reset input. The results of up to 35 previous maxima are available.
Meter	Display	Display a numeric value as a vertical bar graph or speedometer. Complete displays provide bar/needle, label, scale, and background.
Minimum	Calculation, Control	Calculate the minimum of a variable input over time. Optionally control when minimum monitoring is active via the Enable input, and reset the minimum to the current value via the Reset input. The results of up to 35 previous minima are available.
Monitor	Networking	Monitor a single network I/O point and output true if the data quality is bad.
Multistate	Display	Display a unique graphic for each of up to six different conditions.
Neutralzone	Control	Control the on/off status of a signal based on an incoming numeric signal, and based on two potentially variable upper and lower control limits. Use a Neutralzone to control whether a pump is running based on the varying level in a water storage tank, for example.
OneShot	Control, Timers	Introduce a variable time delay between the time the input signal turns on and this timer turns off. The timer turns on immediately when the input turns on, and remains on for the timer duration, and then turns off irrespective of the input signal.

Table A-1. LookoutDirect System Objects (Continued)

Object Class	Category	Description
Pager	Monitoring	Call a numeric or alphanumeric pager and automatically deliver messages based on specified conditions or alarms in your process.
Pipe	Display	Display rectangles on the screen, and control their colors based on a set of up to six different conditions.
PlayWave	Display	Play a standard Windows audio (.wav) clip based upon the satisfaction of a specified condition.
Pot	Control, Display	Create a potentiometer to track and/or alter the value of a numeric variable. A Pot can be displayed on a panel as a slider, rotating knob, or digital display/input.
Pulse	Control, Timers	Create a periodic pulse train of a specified and variable period and duration. The pulse train can be turned on and off based on the state of the On/Off signal.
Pushbutton	Control, Display	Create a push button to navigate between control panels within Lookout, or to initiate any other action, such as executing an external application, or latching a pump on or off.
RadioButtons	Control, Display	Create a set of buttons only one of which can be active at a time. The radio buttons can be displayed in a variety of ways.
Recipe	Control, Display	Create a set of recipes in a spreadsheet application such as Microsoft Excel and import them into a Recipe to allow the user to select a particular recipe. Recipe supports any number of ingredients—each column in the spreadsheet represents a specific ingredient.
Run	Control	Invoke a Windows application or DOS batch command with a variable set of command line parameters, whenever the Run When input signal turns on.
Sample	Calculation, Control	Take a sample of a numeric variable whenever the Reset input goes high. Optionally control when sampling is active via the Enable input, and reset first sample to the current value via the Reset input. The results of up to 35 previous samples are available.

Table A-1. LookoutDirect System Objects (Continued)

Object Class	Category	Description
SampleText	Calculation, Control	Take a sample of a text variable whenever the Reset input goes high. Optionally control when sampling is active via the Enable input, and reset first sample to the current value via the Reset input. The results of up to 35 previous samples are available.
Scale	Display	Create a dynamic scale where the range and minimum/maximum can change dynamically based upon variable inputs.
Sequencer	Control	Create a sequencer object that generates a sequence of states with associated outputs. The sequencer will remain in the current state until that state's time limit is reached or until a Goto or Jump input causes it to transition to another state.
Spinner	Display	Display a small rotating disk that rotates at a speed that varies according to a numeric input value. A Spinner can spin in both directions and can also be controlled by a simple logical input.
Spreadsheet	Logging	Permanently log data to disk in industry-standard comma-separated-value (.csv) spreadsheet files. Specify which variable to sample in each column and set up a logical trigger that will log the set of data each time the trigger goes high or log data at specified time intervals.
Switch	Control, Display	Create a toggle switch to track and/or alter the value of a logical variable. A Switch can be displayed on a panel in a variety of ways.
TextEntry	Control, Display	Allow the operator to track and modify a text value via a control panel, using either the computer keyboard or a keyboard display on the screen.
TimeOfDay	Control, Timers	Schedule a periodic pulse of a specified duration that will occur at some offset into each day. This time can be enabled and disabled via the On/Off input signal.
TimeOfHour	Control, Timers	Schedule a periodic pulse of a specified duration that will occur at some offset into each hour. This time can be enabled and disabled via the On/Off input signal.

Table A-1. LookoutDirect System Objects (Continued)

Object Class	Category	Description
TimeOfMinute	Control, Timers	Schedule a periodic pulse of a specified duration that will occur at some offset into each minute. This time can be enabled and disabled via the On/Off input signal.
TimeOfMonth	Control, Timers	Schedule a periodic pulse of a specified duration that will occur at some offset into each month. This time can be enabled and disabled via the On/Off input signal.
TimeOfWeek	Control, Timers	Schedule a periodic pulse of a specified duration that will occur at some offset into each week. This time can be enabled and disabled via the On/Off input signal.
TimeOfYear	Control, Timers	Schedule a periodic pulse of a specified duration that will occur at some offset into each year. This time can be enabled and disabled via the On/Off input signal.
Waveform	Calculation	Create sine, square, saw tooth, triangle, and random waveforms with specified values for the period, amplitude, offset, phase, and sampling rate.

Lookout*Direct* Driver Objects

The following table lists the Lookout*Direct* driver objects, along with their categories and a description of what each one does.

Table A-2. Lookout*Direct* Driver Objects

Object Class	Category	Description
AB_PLC5	Drivers	Communicate with Allen-Bradley PLC5 line of programmable controllers via serial port, Data Highway Plus (KT, KTx, PCMK, S-S 5136SD), and TCP/IP Ethernet.
AB_SLC500	Drivers	Communicate with Allen-Bradley SLC5xx line of programmable controllers via serial port, Data Highway Plus (KT, KTx, PCMK, S-S 5136SD), and DH485 (AB1747-KE, AB1770-KF3, KTx, PCMK).
ASCII	Drivers	Communicate with any device that transmits and accepts formatted strings of ASCII data. Extract numeric, logical and text values from messages and incorporate them into a Lookout <i>Direct</i> process. For example, one can use the ASCII object class to read the output from a barcode scanner.
DeltaTau	Drivers	Communicate with the Delta Tau Data Systems PMAC Motion Controller cards via dual-ported memory.
DirectLogic	Driver	Communicate with all AutomationDirect (formerly PLCDirect) PLCs through the DirectSoft32 communications server. Supports RS232 and Ethernet. Allows sharing of communications connection between DirectSoft32 - Programming, DSDData, and Lookout <i>Direct</i> .
GE_Series90	Drivers	Communicate with GE Series 90-30 and 90-70 programmable logic controllers via RS-232 using the SNPX serial protocol, or via Ethernet using the GE TCP/IP communication module.
Modbus	Drivers	Communicate with any device that supports the Modbus serial protocols, has a Modbus+ port, or has a Quantum Ethernet module. Modbus+ requires the Modicon Modbus Plus network card and support software to be installed in the computer. The serial protocol communicates via both the ASCII and RTU protocols.

Table A-2. LookoutDirect Driver Objects (Continued)

Object Class	Category	Description
ModbusMOSCAD	Drivers	Communicate with Motorola MOSCAD PLCs and RTUs via the Modbus serial protocols. Supports the Motorola data naming convention.
ModbusSlave	Drivers	Allow other devices or computers to read and write variables in your process by polling a serial port on your computer with the Modbus RTU protocol.
National Instruments Field Point	Drivers	Communicate with National Instrument's FieldPoint modular distributed I/O system via RS-232 or RS-485 serial communications or Ethernet.
NIDAQDevice	Drivers	Communicate with National Instruments data acquisition cards and SCXI hardware connected in parallel mode. Use the NISCXI object class to communicate with SCXI hardware connected in multiplex mode. This object class requires NI-DAQ 5.0 software or better to be installed.
NISCXI	Drivers	Communicate with National Instruments data acquisition devices connected in multiplex mode to SCXI hardware. This object class requires NI-DAQ 5.0 software or better to be installed.
Omron	Drivers	Communicate with Omron PLCs using the Host Link serial protocol.
OPCClient	Drivers	Communicate with OPC (OLE for Process Control) servers. Use the shortcut objects OPCFieldPoint and OPCNIDAQ to make OPC connections to National Instruments FieldPoint modules and data acquisition boards.
Tiway	Drivers	Communicate with the Siemens TI5x5 line of PLCs and other equipment via the serial port using the TBP or NITP protocol, via the TIWAY card or Unilink Host Adapter, or via the CTI or Siemens TCP/IP Ethernet NIM card. Import APT tag files once a Tiway object is created via the Options»Import APT database menu command.

Appendix A