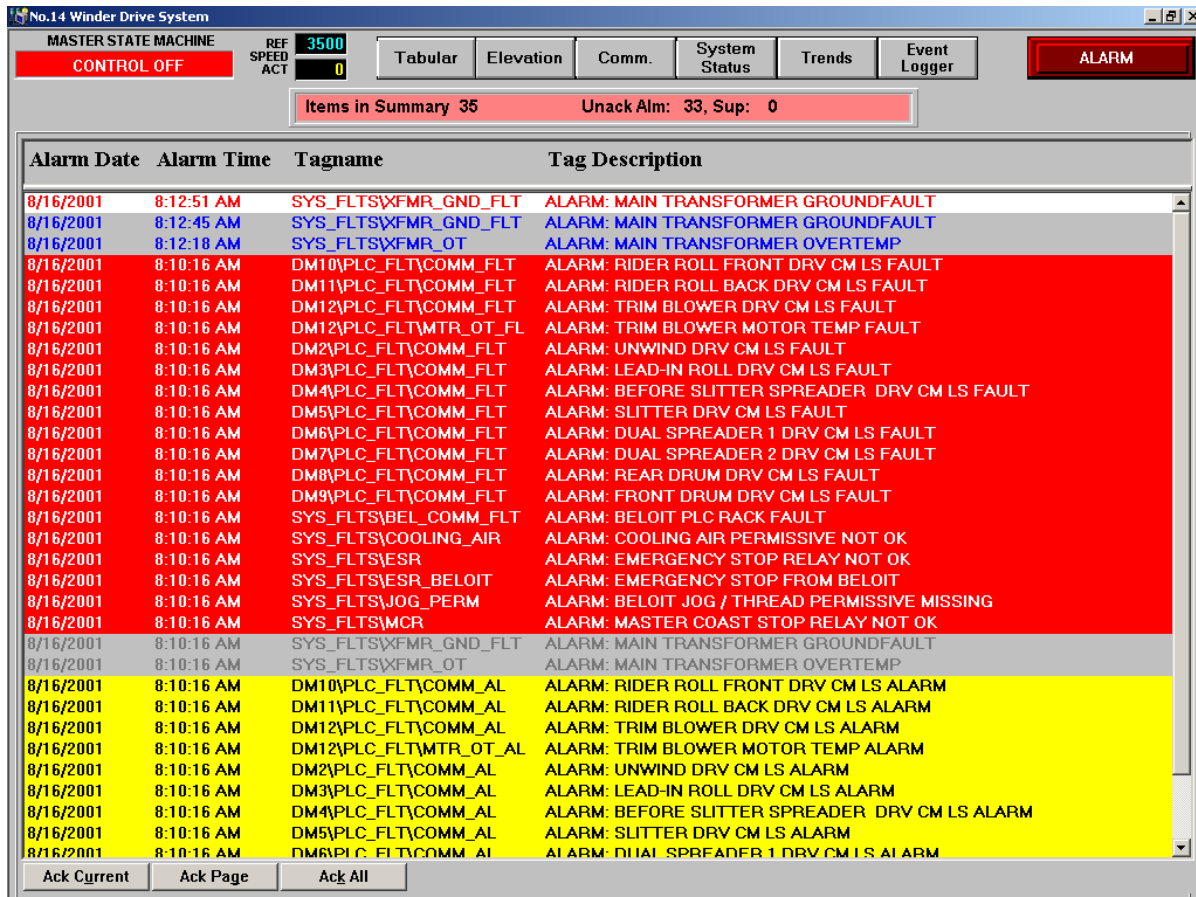


The Event Logger is designed to capture and log various process events, which are detected by a PLC 5 or ControlLogix processor. The events trigger messages, which help diagnose machine malfunctions and process upsets. Events are captured in the exact order of occurrence and accurately time stamped. Conventional HMI alarm-logging techniques incorporated in RSVIEW, Wonderware, and DCS systems are not capable of accurately time stamping multiple events that might occur in a time period less than four seconds. The events are grouped by user-defined categories. There can be up to ten categories. The following list is an example of possible event groups:

- Group 1: PLC Hardware / Software Status
- Group 2: Motor / Drive Faults
- Group 3: Motor Start Time Stamp
- Group 4: Motor Stop Time Stamp
- Group 5: Process Sequence Tracking
- Group 6: Perm / Interlock First-Outs
- Group 7: Equipment Position Faults
- Group 8: Operator Commands
- Group 9: Miscellaneous Events
- Group 10: (ControlLogix Processor Only)

Each event is time stamped with the PLC processor internal clock to an accuracy of one program scan. Events occurring simultaneously in one program scan will be detected as such and logged with identical time stamps. The events are stored in a FIFO array until polled by the Event Logger VB program, which runs as a stand alone application or in conjunction with an RSVIEW or Wonderware application (HMI) on the diagnostic computer. If loss of communication occurs with the diagnostic computer, the FIFO array in the PLC processor will continue to accumulate events. The PLC processor will always store the most recent events – up to a maximum of 50 (can be expanded if necessary). As the diagnostic computer polls the accumulated events, the event is unloaded from the FIFO array and displayed on the HMI event screen. The event is also logged to an Access database and a comma delimited '.csv' file (example - EL Log 04_2001.csv) that can be imported into Excel for viewing and sorting. The 'EL Log' file contains all the events for a given month. The Event Logger application synchronizes the time clocks of the PLC processors with the diagnostic computer.

Typical RSView / Wonderware Alarm Screen



Alarm Date	Alarm Time	Tagname	Tag Description
8/16/2001	8:12:51 AM	SYS_FLTS\FMR_GND_FLT	ALARM: MAIN TRANSFORMER GROUNDFAULT
8/16/2001	8:12:45 AM	SYS_FLTS\FMR_GND_FLT	ALARM: MAIN TRANSFORMER GROUNDFAULT
8/16/2001	8:12:18 AM	SYS_FLTS\FMR_OT	ALARM: MAIN TRANSFORMER OVERTEMP
8/16/2001	8:10:16 AM	DM10\PLC_FLT\COMM_FLT	ALARM: RIDER ROLL FRONT DRV CM LS FAULT
8/16/2001	8:10:16 AM	DM11\PLC_FLT\COMM_FLT	ALARM: RIDER ROLL BACK DRV CM LS FAULT
8/16/2001	8:10:16 AM	DM12\PLC_FLT\COMM_FLT	ALARM: TRIM BLOWER DRV CM LS FAULT
8/16/2001	8:10:16 AM	DM12\PLC_FLT\MTR_OT_FL	ALARM: TRIM BLOWER MOTOR TEMP FAULT
8/16/2001	8:10:16 AM	DM2\PLC_FLT\COMM_FLT	ALARM: UNWIND DRV CM LS FAULT
8/16/2001	8:10:16 AM	DM3\PLC_FLT\COMM_FLT	ALARM: LEAD-IN ROLL DRV CM LS FAULT
8/16/2001	8:10:16 AM	DM4\PLC_FLT\COMM_FLT	ALARM: BEFORE SLITTER SPREADER DRV CM LS FAULT
8/16/2001	8:10:16 AM	DM5\PLC_FLT\COMM_FLT	ALARM: SLITTER DRV CM LS FAULT
8/16/2001	8:10:16 AM	DM6\PLC_FLT\COMM_FLT	ALARM: DUAL SPREADER 1 DRV CM LS FAULT
8/16/2001	8:10:16 AM	DM7\PLC_FLT\COMM_FLT	ALARM: DUAL SPREADER 2 DRV CM LS FAULT
8/16/2001	8:10:16 AM	DM8\PLC_FLT\COMM_FLT	ALARM: REAR DRUM DRV CM LS FAULT
8/16/2001	8:10:16 AM	DM9\PLC_FLT\COMM_FLT	ALARM: FRONT DRUM DRV CM LS FAULT
8/16/2001	8:10:16 AM	SYS_FLTS\BEL_COMM_FLT	ALARM: BELOIT PLC RACK FAULT
8/16/2001	8:10:16 AM	SYS_FLTS\COOLING_AIR	ALARM: COOLING AIR PERMISSIVE NOT OK
8/16/2001	8:10:16 AM	SYS_FLTS\ESR	ALARM: EMERGENCY STOP RELAY NOT OK
8/16/2001	8:10:16 AM	SYS_FLTS\ESR_BELOIT	ALARM: EMERGENCY STOP FROM BELOIT
8/16/2001	8:10:16 AM	SYS_FLTS\JOG_PERM	ALARM: BELOIT JOG / THREAD PERMISSIVE MISSING
8/16/2001	8:10:16 AM	SYS_FLTS\MCR	ALARM: MASTER COAST STOP RELAY NOT OK
8/16/2001	8:10:16 AM	SYS_FLTS\FMR_GND_FLT	ALARM: MAIN TRANSFORMER GROUNDFAULT
8/16/2001	8:10:16 AM	SYS_FLTS\FMR_OT	ALARM: MAIN TRANSFORMER OVERTEMP
8/16/2001	8:10:16 AM	DM10\PLC_FLT\COMM_AL	ALARM: RIDER ROLL FRONT DRV CM LS ALARM
8/16/2001	8:10:16 AM	DM11\PLC_FLT\COMM_AL	ALARM: RIDER ROLL BACK DRV CM LS ALARM
8/16/2001	8:10:16 AM	DM12\PLC_FLT\COMM_AL	ALARM: TRIM BLOWER DRV CM LS ALARM
8/16/2001	8:10:16 AM	DM12\PLC_FLT\MTR_OT_AL	ALARM: TRIM BLOWER MOTOR TEMP ALARM
8/16/2001	8:10:16 AM	DM2\PLC_FLT\COMM_AL	ALARM: UNWIND DRV CM LS ALARM
8/16/2001	8:10:16 AM	DM3\PLC_FLT\COMM_AL	ALARM: LEAD-IN ROLL DRV CM LS ALARM
8/16/2001	8:10:16 AM	DM4\PLC_FLT\COMM_AL	ALARM: BEFORE SLITTER SPREADER DRV CM LS ALARM
8/16/2001	8:10:16 AM	DM5\PLC_FLT\COMM_AL	ALARM: SLITTER DRV CM LS ALARM
8/16/2001	8:10:16 AM	DM6\PLC_FLT\COMM_AL	ALARM: DUAL SPREADER 1 DRV CM LS ALARM

Typical HMI Deficiencies:

- Single line per alarm/event – limited information.
- Color schemes can be confusing – duplication of alarm/event information.
- Application must be shutdown to add additional alarm/event message.
- One must be knowledgeable of HMI software to add alarm/event message.
- Each alarm/event tag consumes tag count.
- Alarms/events not necessarily logged in exact order of occurrence.
- Alarms/events limited to one-second resolution.
- Alarms/events occurring in one PLC program scan will be missed.
- Alarm/events do not support filtering.

Event Logger Screen

REFINERS		EVENTS		Nikos		9 / 13 / 2000 10:12:53					
EVENTS IN LAST 24 HOURS											
<table border="0"> <tr> <td style="vertical-align: top;"> <p>W3_WE_Additives MOTOR STARTED</p> <p>W3_WE_Additives VALVE FAULT Not Closing PLC Chassis C2</p> <p>W3_WE_Additives MOTOR STARTED</p> <p>W3_WE_Additives MOTOR STOPPED</p> <p>W3_WE_Additives HW DCS STOP</p> <p>W3_WE_Additives MOTOR STARTED</p> <p>W3_WE_Additives HW DCS STOP</p> <p>W3_WE_Additives MOTOR FAULT MCC LF-4 PLC Chassis C7</p> <p>W3_WE_Additives TSS BYPASS MODE</p> <p>W3_WE_Additives UNLOAD REFINER 713-PSL-0353 N13_WE_HW[7].11</p> </td> <td style="vertical-align: top;"> <p>[Event 5-24] 713-041-013</p> <p>[Event 8-10] 713-EV-0652 Valve De-Ener (WE MCC Rm)</p> <p>[Event 5-140] 723-041-121</p> <p>[Event 6-123] 723-041-069</p> <p>[Event 9-123] 723-041-069</p> <p>[Event 5-117] 723-041-059</p> <p>[Event 9-24] 713-041-013</p> <p>[Event 2-1] 461-041-071 (WE MCC Rm) (WE MCC Rm)</p> <p>[Event 10-38] 713-041-025</p> <p>[Event 7-39] Primary Refiner West - Loss Of Load Permissive Refiner Inlet Press Below 20 PSI Honeywell DCS Write</p> </td> <td style="vertical-align: top;"> <p>09/13/2000 10:10:59.362a Blend Chest Agitator</p> <p>09/13/2000 10:09:09.488a Thick Stock Screens Bypass (E/O) Check: Input Fuse / Air / ZSC Limit EV C2:9:0.Data.0 ZSC C2:8:I.Data.0</p> <p>09/13/2000 10:08:38.590a WE Starch Supply Pump South</p> <p>09/13/2000 10:07:48.699a #2 Dye Tank Pump</p> <p>09/13/2000 10:07:43.739a #2 Dye Tank Pump</p> <p>09/13/2000 10:06:22.659a Cooked SP Starch Supply Pp North</p> <p>09/13/2000 10:05:48.252a Blend Chest Agitator</p> <p>09/13/2000 10:04:52.110a #10 HD Agitator NOT RUNNING Check: OL's / Aux Contact / PLC Fuse AUX C7:1:I.Data.1 MAG C7:4:0.Data.0</p> <p>09/13/2000 10:04:26.613a Tert Thick Stock Screen Pump STOPPED</p> <p>09/13/2000 09:40:43.343a Primary Refiner West - Loss Of Load Permissive Refiner Inlet Press Below 20 PSI Honeywell DCS Write</p> </td> </tr> </table>								<p>W3_WE_Additives MOTOR STARTED</p> <p>W3_WE_Additives VALVE FAULT Not Closing PLC Chassis C2</p> <p>W3_WE_Additives MOTOR STARTED</p> <p>W3_WE_Additives MOTOR STOPPED</p> <p>W3_WE_Additives HW DCS STOP</p> <p>W3_WE_Additives MOTOR STARTED</p> <p>W3_WE_Additives HW DCS STOP</p> <p>W3_WE_Additives MOTOR FAULT MCC LF-4 PLC Chassis C7</p> <p>W3_WE_Additives TSS BYPASS MODE</p> <p>W3_WE_Additives UNLOAD REFINER 713-PSL-0353 N13_WE_HW[7].11</p>	<p>[Event 5-24] 713-041-013</p> <p>[Event 8-10] 713-EV-0652 Valve De-Ener (WE MCC Rm)</p> <p>[Event 5-140] 723-041-121</p> <p>[Event 6-123] 723-041-069</p> <p>[Event 9-123] 723-041-069</p> <p>[Event 5-117] 723-041-059</p> <p>[Event 9-24] 713-041-013</p> <p>[Event 2-1] 461-041-071 (WE MCC Rm) (WE MCC Rm)</p> <p>[Event 10-38] 713-041-025</p> <p>[Event 7-39] Primary Refiner West - Loss Of Load Permissive Refiner Inlet Press Below 20 PSI Honeywell DCS Write</p>	<p>09/13/2000 10:10:59.362a Blend Chest Agitator</p> <p>09/13/2000 10:09:09.488a Thick Stock Screens Bypass (E/O) Check: Input Fuse / Air / ZSC Limit EV C2:9:0.Data.0 ZSC C2:8:I.Data.0</p> <p>09/13/2000 10:08:38.590a WE Starch Supply Pump South</p> <p>09/13/2000 10:07:48.699a #2 Dye Tank Pump</p> <p>09/13/2000 10:07:43.739a #2 Dye Tank Pump</p> <p>09/13/2000 10:06:22.659a Cooked SP Starch Supply Pp North</p> <p>09/13/2000 10:05:48.252a Blend Chest Agitator</p> <p>09/13/2000 10:04:52.110a #10 HD Agitator NOT RUNNING Check: OL's / Aux Contact / PLC Fuse AUX C7:1:I.Data.1 MAG C7:4:0.Data.0</p> <p>09/13/2000 10:04:26.613a Tert Thick Stock Screen Pump STOPPED</p> <p>09/13/2000 09:40:43.343a Primary Refiner West - Loss Of Load Permissive Refiner Inlet Press Below 20 PSI Honeywell DCS Write</p>	<p>MSG COLOR</p> <p>● LAST 5 MIN</p> <p>● LAST 10 MIN</p> <p>● LAST 24 HR</p> <p>EVENT HISTORY</p> <p>EVENT GROUP DISPLAY FILTER</p> <p><input type="checkbox"/> SHOW PLC STATUS</p> <p><input type="checkbox"/> SHOW MOTOR NOT RUNNING</p> <p><input type="checkbox"/> SHOW MOTOR NOT STOPPED</p> <p><input type="checkbox"/> SHOW MOTOR CNTL POWER LOSS</p> <p><input type="checkbox"/> SHOW MOTOR START TIME STAMP</p> <p><input type="checkbox"/> SHOW MOTOR STOP TIME STAMP</p> <p><input type="checkbox"/> SHOW PERM /ITLK STATUS</p> <p><input type="checkbox"/> SHOW VALVE POS STATUS</p> <p><input type="checkbox"/> SHOW OPERATOR COMMANDS</p> <p><input type="checkbox"/> SHOW MISC ALARMS</p>
<p>W3_WE_Additives MOTOR STARTED</p> <p>W3_WE_Additives VALVE FAULT Not Closing PLC Chassis C2</p> <p>W3_WE_Additives MOTOR STARTED</p> <p>W3_WE_Additives MOTOR STOPPED</p> <p>W3_WE_Additives HW DCS STOP</p> <p>W3_WE_Additives MOTOR STARTED</p> <p>W3_WE_Additives HW DCS STOP</p> <p>W3_WE_Additives MOTOR FAULT MCC LF-4 PLC Chassis C7</p> <p>W3_WE_Additives TSS BYPASS MODE</p> <p>W3_WE_Additives UNLOAD REFINER 713-PSL-0353 N13_WE_HW[7].11</p>	<p>[Event 5-24] 713-041-013</p> <p>[Event 8-10] 713-EV-0652 Valve De-Ener (WE MCC Rm)</p> <p>[Event 5-140] 723-041-121</p> <p>[Event 6-123] 723-041-069</p> <p>[Event 9-123] 723-041-069</p> <p>[Event 5-117] 723-041-059</p> <p>[Event 9-24] 713-041-013</p> <p>[Event 2-1] 461-041-071 (WE MCC Rm) (WE MCC Rm)</p> <p>[Event 10-38] 713-041-025</p> <p>[Event 7-39] Primary Refiner West - Loss Of Load Permissive Refiner Inlet Press Below 20 PSI Honeywell DCS Write</p>	<p>09/13/2000 10:10:59.362a Blend Chest Agitator</p> <p>09/13/2000 10:09:09.488a Thick Stock Screens Bypass (E/O) Check: Input Fuse / Air / ZSC Limit EV C2:9:0.Data.0 ZSC C2:8:I.Data.0</p> <p>09/13/2000 10:08:38.590a WE Starch Supply Pump South</p> <p>09/13/2000 10:07:48.699a #2 Dye Tank Pump</p> <p>09/13/2000 10:07:43.739a #2 Dye Tank Pump</p> <p>09/13/2000 10:06:22.659a Cooked SP Starch Supply Pp North</p> <p>09/13/2000 10:05:48.252a Blend Chest Agitator</p> <p>09/13/2000 10:04:52.110a #10 HD Agitator NOT RUNNING Check: OL's / Aux Contact / PLC Fuse AUX C7:1:I.Data.1 MAG C7:4:0.Data.0</p> <p>09/13/2000 10:04:26.613a Tert Thick Stock Screen Pump STOPPED</p> <p>09/13/2000 09:40:43.343a Primary Refiner West - Loss Of Load Permissive Refiner Inlet Press Below 20 PSI Honeywell DCS Write</p>									

Event Logger Enhancements:

- Improved readability – simple color scheme. Red message indicates event occurred in the last 5 minutes, blue in the last 10 minutes (cooling off), and black in the last 24 hours. Times are configurable.
- Event message can be up to four lines, giving detailed information to assist an operator or technician in troubleshooting. Event messages can contain information such as MCC room location, PLC I/O addresses, PLC enclosure identification, device location, equipment tag numbers, and storeroom part numbers.
- Event group display filter will hide or show events for a particular group. All events continue to log in the background. Event groups such as operator commands and motor start/stop time stamps can be activated when analyzing the sequence of events.

- Each event message does not require an RSView / Wonderware tag. A 150 tag package can display unlimited number of events.
- Event messages can be easily added without shutting down the RSView / Wonderware application. No prior working knowledge of RSView / Wonderware software is needed. The Event Logger uses a simple database entry form to add, modify, and delete event messages.
- Events are captured in the exact order of occurrence – to within one program scan of PLC processor. Event time stamp displays milliseconds.
- Event Logger history is accessible from remote computers if diagnostic computer is connected to a network.
- Event history for each month logged to an Excel '.csv' file for easy retrieval.