Installation

Automation Integrated Configuration

309871 rev.B

Part No. 234281

For use with PrecisionFlo LT automation intergrated units.

PROVEN QUALITY. LEADING TECHNOLOGY.

Graco Inc. P.O. Box 1441 Minneapolis, MN 55440-1441

Automation Integrated Configuration

The PrecisionFlo LT system uses the MODBUS RTU protocol to communicate between the control board and the display board. The details of the data communication registers are in the section called **LT MODBUS Memory Map**, see page 4. The purpose of including these details is to allow customization of the PrecisionFlo LT system. In this scenario, the user will typically purchase the automation Integrated configuration of the system. This configuration does not include a user interface. The controls and wiring harnesses are provided and it is left to the user to provide an enclosure and user interface to the system.

This document is not intended to provide the technical details of the MODBUS standard. The purpose here is to show how the PrecisionFlo LT system implements MODBUS and to explain how to integrate the LT system using MODBUS. For more technical details on how MODBUS works, see www.modbus.org.

The LT control board serves as a MODBUS RTU slave. The physical connection will be through a RS232 connection on the control board. The LT board will reply to MODBUS requests from any MODBUS master station number, so a multiple station (RS485) MODBUS implementation will not be directly supported.

The wiring for this connection is as follows.

RS232 (from Master)	**LT Connection Point**
Receive	J2-5
Transmit	J2-6
Signal Ground	J2-7

The RS232 port is configured for the following parameters.

Baud Rate	57600
Data	8 bit
Parity	None
Stop	1 bit
Flow Control	None

Only a subset of the MODBUS protocol is supported in order to reduce the resource requirements. The function codes supported are as follows.

Function Code	**Description**
3	Read holding registers
16	Write multiple registers

The data that is read or written to on the LT control board will be mapped to MODBUS Holding Registers. These are 16 bit registers starting at address 40000. The LT uses registers in the range of 40000 to 42000. The MODBUS standard and the LT system use Big Endian byte order (most significant byte is stored in the lowest memory address). If the data storage on the controller needs to be more than 16 bits, then two consecutive MODBUS registers are used. The following table shows how a 32-bit value would be mapped in MODBUS where Byte3 is the most significant byte and Byte0 is the least significant byte (Byte3 Byte2 Byte1 Byte0).

MODBUS Address	**High Byte**	**Low Byte**
40010	Byte3	Byte2
40011	Byte1	Byte0

Most of the variables used in the LT system have limits assigned to them. These limits can be viewed on the LT MODBUS memory map table. If a MODBUS write operation tries to set a value that is outside of these limits, the maximum or minimum value will be written instead of the original desired value. Other variables are read-only and not intended to be written to. Examples of these are the run variables that correspond to the digital I/O on the system (ex. automation gun signal – *automation Gun*). If these registers are written to, they will immediately be changed back to the state that matches

Run Data – 40000 - 40499

The run data is data that is being modified by the controller as the system is running. Many of the registers in this area are things that a user may want to monitor while the system is running. They will indicate things such as pressures, flow rates, % errors, active faults, and status of I/O points. The values of these registers are stored in RAM on the controller and are never stored to flash memory.

Setup Data – 40500 - 40999

The setup data is the data that tells how the system is configured. Many of these registers are things that the user will not change very often. The values of these registers are stored to flash memory periodically and also any time the *InSetup* (40037) changes from a value of 1 to 0.

Job Log Data – 41000 - 41499

The job log data is read only data that is read directly from flash memory to the MODBUS holding registers. These registers will update automatically as new jobs are logged in the system. The most recent eight jobs are stored in these registers. The last 500 jobs are also available via download on the other serial port on the controller (Graco Shell serial interface).

Fault Log Data – 41500 - 41999

The fault log data is read only data that is read directly from flash memory to the MODBUS holding registers. These registers will update automatically as new faults are logged in the system. The most recent eight faults are stored in these registers. The last 500 faults are also available via download on the other serial port on the controller (Graco Shell serial interface).

Manual Dispense and Calibration

The controller constantly monitors the run data to decide if a manual dispense or calibration is required. These type of dispenses will only be operational if the system is in the manual dispense mode (*DispenseMode*=0).

A manual dispense will be possible as long as a value of 1 is written *ManualGun* every second. Otherwise, the manual dispense will time out after one second. This is implemented as a safety feature to make sure that the gun does not get stuck on in the event of a communications error.

The registers *PressTune* and *FlowCal* are used to initiate a pressure tune or a flow calibration respectively. The registers *TuneActive* or *CalActive* will then have a value of one as long as the calibration is in progress. It should be noted that flow calibrations are only valid for running in the Bead Mode (*ControlMode*=0). If a flow calibration is requested, the system will first run the pressure tune routine and then the flow calibration routine will start automatically after the pressure tune is finished.

Updating Registers

It is not necessary to read the setup data, fault log data, and job log data constantly. The variables in these register areas do not change very often, so three flags were added to the run data to indicate a change in these other data areas. The flags are called *AlarmsChanged*, *JobsChanged*, and *SetupChanged*. If one of these registers has a value of one, the MODBUS master should read the appropriate data and write the value of the flag back to zero.

Fault Bits

The registers *FaultBits* and *FltType* use the bit order below to determine which bit of the register corresponds to which fault. In the *FaultBits* register, if a fault is active, it's corresponding bit will have a value of 1 (otherwise it will be zero). In the *FltType* register, a value of 1 means that the fault is an alarm and a value of zero means that it is a warning. The highest priority active fault will also appear in the *ActiveFault* register. The value of the fault will be it's bit value plus one (ex. the Low Analog fault would create *ActiveFault*=7).

In the following table, Bit 0 is the least significant bit of the register and Bit 15 is the most significant bit of the register. There are currently two registers allocated for *FaultBits* and *FltType,* but the most significant registers are reserved for future expansion.

Fault	Bit
Communication Error	0
Dispenser Stop	1
Power Up	2
Calibration Error	3
Closed Gun Flow	4
Volume Compensation Limit	5
Low Analog	6
High Pressure	7
Low Pressure	8
High Volume	9
Low Volume	10
Low Flow Rate	11
High Flow Rate	12
Computed Target	13
Default Kp and Ki Loaded	14
Setup Change	15

LT MODBUS Memory Map

MODBUS Variables

Group	Variable	Modbus Addr	Type	Values	Default	Description
run	OutPress	40002	word	0 to 5000	N/A	Regulator outlet pressure in PSI
run	FlowRate	40003	word	0 to 5000	N/A	Flow rate in cc/min
run	Automation Cmd	40004	word	0 to 100	N/A	Automation command in %
run	Style	40005	word	0 to 15	N/A	Current dispense style selected
run	VolDisp	40006	lword	0 to 99999999	N/A	Volume dispensed during the latest job, xxxxxxx.y cc
run	RequestVol	40008	lword	0 to 99999999	N/A	Volume requested during the latest job, xxxxxxx.y cc
run	ReqError	40010	long	-1000 to 5000	N/A	Volume error (vs requested volume) at the end of the last dispense job, xxx.y %
run	MeasError	40012	long	-1000 to 5000	N/A	Volume error (vs measured volume) at the end of the last dispense job, xxx.y %
run	DesPress	40014	word	0 to 5000	N/A	Desired regulator outlet pressure in PSI
run	DesFlow	40015	word	0 to 5000	N/A	Desired flow rate in cc/min
run	ActiveFault	40016	lword	see fault codes	N/A	Highest priority fault code, used for display. 0 = none

Group	Variable	Modbus Addr	Type	Values	Default	Description
run	Alarm-sChanged	40018	word	0 to 1	N/A	Indicates that fault values should be read
run	JobsChanged	40019	word	0 to 1	N/A	Indicates that job values should be read
run	Set-upChanged	40020	word	0 to 1	N/A	Indicates that setup values should be read
run	ManualGun	40021	word	0 to 1	N/A	1 = manual dispense request
run	FaultBits	40022	lword	Bit logic	N/A	Individual bits set when faults present
run	ControlVer	40024	lword	0 to 0xfffff	N/A	Version of the control software, xx.yy.zz format
run	Year	40026	word	2 to 99	N/A	Holds the year value for display and logging
run	Month	40027	word	1 to 12	N/A	Holds the month value for display and logging
run	Day	40028	word	1 to 31	N/A	Holds the day value for display and logging
run	Hour	40029	word	0 to 23	N/A	Holds the hour value for display and logging
run	Minute	40030	word	0 to 59	N/A	Holds the minute value for display and logging
run	Second	40031	word	0 to 59	N/A	Holds the second value for display and logging
run	PressTune	40032	word	0 to 1	N/A	1 = request pressure tune
run	TuneActive	40033	word	0 to 1	N/A	1 = pressure tune in progress
run	FlowCal	40034	word	0 to 1	N/A	1 = request flow calibration
run	CalActive	40035	word	0 to 1	N/A	1 = flow cal in progress
run	ResetFaults	40036	word	0 to 1	N/A	1 = reset faults
run	InSetup	40037	word	0 to 1	N/A	1 = in setup mode
run	LoadDefaults	40038	word	0 to 1	N/A	1 = load factory defaults
run	JobActive	40039	word	0 to 1	N/A	1 = dispense job active
run	BatchActive	40040	word	0 to 1	N/A	1= dispense batch active
run	Automation Gun	40041	word	0 to 1	N/A	1 = automation gun request
run	JobComplete	40042	word	0 to 1	N/A	1 = automation job complete request
run	ControlOn	40043	word	0 to 1	N/A	1 = control on signal active
run	Style1	40044	word	0 to 1	N/A	1 = style1 automation signal active
run	Style2	40045	word	0 to 1	N/A	1 = style2 automation signal active
run	GunSolenoid	40046	word	0 to 1	N/A	1 = dispense gun solenoid active
run	DispReady	40047	word	0 to 1	N/A	1 = dispenser ready signal active
run	FaultPresent	40048	word	0 to 1	N/A	1 = fault present signal active
run	Spare5	40049	word	N/A	N/A	N/A
run	MinVolDisp	40050	word	0 to 1	N/A	1 = minimum volume dispensed signal active
run	Style3	40051	word	0 to 1	N/A	1 = style3 automation signal active
run	DisplayVer	40052	lword	0 to 0xffff	N/A	Version of the display software xx,yy,zz format
run	Style4	40054	word	0 to 1	N/A	1 = style4 automation signal active

Group	Variable	Modbus Addr	Type	Values	Default	Description
setup	Kp	40502	word	0 to 9999	100	Pressure loop proportional constant
setup	Ki	40503	word	0 to 9999	6	Pressure loop integral constant
setup	ZeroOffset	40504	long	-999 to 999	0	Zero offset value of volume comp, % of flow cal result
setup	PeakAdj	40506	long	-999 to 999	100	Peak adjust value of volume comp, % of flow cal result
setup	SysMaxFlow	40508	word	0 to 5000	2500	Maximum possible flow rate with reg wide open, cc/min
setup	SysMaxPress	40509	word	0 to 5000	2500	Pressure at reg outlet with reg wide open, psi
setup	FlowCalPress	40510	word	0 to 5000	2500	Result of flow cal, PSI required to achieve FlowCalPress
setup	ManSpeed	40511	word	0 to 100	50	Percent of maximum command to use for manual dispensing
setup	TargetVol0	40512	lword	0 to 99999	250	User entered volume target for style 1, xx.y cc
setup	TargetVol1	40514	lword	0 to 99999	250	User entered volume target for style 2, xx.y cc
setup	TargetVol2	40516	lword	0 to 99999	250	User entered volume target for style 3, xx.y cc
setup	TargetVol3	40518	lword	0 to 99999	250	User entered volume target for style 4, xx.y cc
setup	TargetVol4	40520	lword	0 to 99999	250	User entered volume target for style 5, xx.y cc
setup	TargetVol5	40522	lword	0 to 99999	250	User entered volume target for style 6, xx.y cc
setup	TargetVol6	40524	lword	0 to 99999	250	User entered volume target for style 7, xx.y cc
setup	TargetVol7	40526	lword	0 to 99999	250	User entered volume target for style 8, xx.y cc
setup	TargetVol8	40528	lword	0 to 99999	250	User entered volume target for style 9, xx.y cc
setup	TargetVol9	40530	lword	0 to 99999	250	User entered volume target for style 10, xx.y cc
setup	TargetVol10	40532	lword	0 to 99999	250	User entered volume target for style 11, xx.y cc
setup	TargetVol11	40534	lword	0 to 99999	250	User entered volume target for style 12, xx.y cc
setup	TargetVol12	40536	lword	0 to 99999	250	User entered volume target for style 13, xx.y cc
setup	TargetVol13	40538	lword	0 to 99999	250	User entered volume target for style 14, xx.y cc
setup	TargetVol14	40540	lword	0 to 99999	250	User entered volume target for style 15, xx.y cc
setup	TargetVol15	40542	lword	0 to 99999	250	User entered volume target for style 16, xx.y cc

Group	Variable	Modbus Addr	Type	Values	Default	Description
setup	PercTar0	40544	word	0 to 999	100	User entered volume and flow rate tolerance for style 1, xx.y %
setup	PercTar1	40545	word	0 to 999	100	User entered volume and flow rate tolerance for style 2, xx.y %
setup	PercTar2	40546	word	0 to 999	100	User entered volume and flow rate tolerance for style 3, xx.y %
setup	PercTar3	40547	word	0 to 999	100	User entered volume and flow rate tolerance for style 4, xx.y %
setup	PercTar4	40548	word	0 to 999	100	User entered volume and flow rate tolerance for style 5, xx.y %
setup	PercTar5	40549	word	0 to 999	100	User entered volume and flow rate tolerance for style 6, xx.y %
setup	PercTar6	40550	word	0 to 999	100	User entered volume and flow rate tolerance for style 7, xx.y %
setup	PercTar7	40551	word	0 to 999	100	User entered volume and flow rate tolerance for style 8, xx.y %
setup	PercTar8	40552	word	0 to 999	100	User entered volume and flow rate tolerance for style 9, xx.y %
setup	PercTar9	40553	word	0 to 999	100	User entered volume and flow rate tolerance for style 10, xx.y %
setup	PercTar10	40554	word	0 to 999	100	User entered volume and flow rate tolerance for style 11, xx.y %
setup	PercTar11	40555	word	0 to 999	100	User entered volume and flow rate tolerance for style 12, xx.y %
setup	PercTar12	40556	word	0 to 999	100	User entered volume and flow rate tolerance for style 13, xx.y %
setup	PercTar13	40557	word	0 to 999	100	User entered volume and flow rate tolerance for style 14, xx.y %
setup	PercTar14	40558	word	0 to 999	100	User entered volume and flow rate tolerance for style 15, xx.y %
setup	PercTar15	40559	word	0 to 999	100	User entered volume and flow rate tolerance for style 16, xx.y %
setup	DefaultCommand	40560	word	0 to 100	50	% of 10 VDC command for fixed mode or when analog failure, 0=disable low analog alarm
setup	RegPreCharge	40561	word	0 to 500	0	V/P command when regulator off, x.yy VDC
setup	JobEndDelay	40562	word	1 to 99	4	Number of seconds after gun closes before job ends
setup	Spare1	40563	word	N/A	N/A	N/A
setup	Kfactor	40564	lword	1 to 99999	3500	Flow meter k-factor, pulses per liter

Group	Variable	Modbus Addr	Type	Values	Default	Description
setup	Spare2	40566	word	N/A	N/A	N/A
setup	MaxDesFlow	40567	word	0 to 5000	1000	Desired flow rate for 10 VDC command, cc/min
setup	FltType	40568	lword	Bit logic		Individual bits set to select fault level; 1 = alarm, 0 = warning
setup	MaxPsi	40570	word	0 to 5000	1000	Desired psi with 10 VDC command in pressure mode
setup	GunOnDelay	40571	word	0 to 999	0	Delay after gun on request before turning on solenoid, msec
setup	RegOnDelay	40572	word	0 to 999	0	Delay after reg on request before turning on reg V/P, msec
setup	GunOffDelay	40573	word	0 to 999	0	Delay after gun off request before turning off solenoid, msec
setup	RegOffDelay	40574	word	0 to 999	0	Delay after reg off request before turning off reg V/P, msec
setup	FlowFltTm	40575	word	1 to 99	2	Consecutive time (sec) with flow rate outside tol before fault
setup	MinOutPress	40576	word	0 to 5000	0	Lower limit for reg outlet pressure before fault
setup	MaxOutPress	40577	word	0 to 5000	5000	Upper limit for reg outlet pressure before fault
setup	FlowCompPivot	40578	word	0 to 100	50	Percent of 10 VDC max command for peak vs zero offset adjust
setup	ZeroPressVoltOut	40579	word	0 to 499	100	Pressure sensor output voltage at 0 PSI, x.yy VDC
setup	FiveVoltPsiOut	40580	word	0 to 5000	3500	Regulator outlet PSI that generates a 5 VDC sensor signal
setup	FlowAvg	40581	word	2 to 99	4	Number of flow meters pulses per flow rate calculation
setup	FlowRate5V	40582	word	0 to 9999	5000	Flow rate equivalent to 5 VDC analog output on automation I/O
setup	ScreenTimeout	40583	word	0 to 99	0	Minutes for backlight off after button press, 0 = disable
setup	JobEndMode	40584	word	0 to 1	0	0 = digital I/O, 1 = delay timer
setup	Language	40585	word	0 to 7	0	Sets the language for the display
setup	PressUnits	40586	word	0 to 1	1	0 = bar, 1 = PSI
setup	ControlMode	40587	word	0 to 3	0	0 = bead control, 1 = volume monitor, 2 = batch dispense, 3=pressure control
setup	DispenseMode	40588	word	0 to 1	0	0 = manual, 1 = auto
setup	AutomationCommandMode	40589	word	0 to 1	0	0 = fixed, 1 = analog
setup	StyleNumber	40590	word	1 to 16	N/A	Current Style
setup	RunModeBeadAdj	40591	word	0 to 1	0	1 = enable run mode bead adjustment
setup	Spare4	40592	word	N/A	N/A	N/A
setup	DateFormat	40593	word	0 to 1	1	0 = dd/mm/yy, 1 = mm/dd/yy
setup	DefaultsLoaded	40594	lword	N/A	N/A	Contains 0xABCD after defaults loaded

Group	Variable	Modbus Addr	Type	Values	Default	Description
setup	BeadScale	40596	word	50 to 150	100	Used to adjust dispense rate, %
setup	BatchAdj0	40597	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 1
setup	BatchAdj1	40598	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 2
setup	BatchAdj2	40599	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 3
setup	BatchAdj3	40600	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 4
setup	BatchAdj4	40601	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 5
setup	BatchAdj5	40602	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 6
setup	BatchAdj6	40603	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 7
setup	BatchAdj7	40604	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 8
setup	BatchAdj8	40605	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 9
setup	BatchAdj9	40606	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 10
setup	BatchAdj10	40607	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 11
setup	BatchAdj11	40608	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 12
setup	BatchAdj12	40609	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 13
setup	BatchAdj13	40610	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 14
setup	BatchAdj14	40611	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 15
setup	BatchAdj15	40612	word	0 to 10	1	Volume target adjustment in FM pulses for batch mode style 16
setup	ValidCal	40613	word	0 to 1	0	1 = valid flow cal completed
setup	StationNum	40614	word	1 to 245	1	Modbus Station Number
setup	LastKp	40615	word	0 to 9999	N/A	Last valid Kp value
setup	LastKi	40616	word	0 to 9999	N/A	Last valid Ki value

Group	Variable	Modbus Addr	Type	Values	Default	Description
joblog[0]	date	41002	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day
joblog[0]	time	41004	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
joblog[0]	measured	41006	lword	0 to 99999		volume measured for job
joblog[0]	requested	41008	lword	0 to 99999		volume requested for job
joblog[0]	process	41010	lword	0 to 99999		process volume for job
joblog[0]	error	41012	long	0 to 999		error for job
joblog[1]	date	41014	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day
joblog[1]	time	41016	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
joblog[1]	measured	41018	lword	0 to 99999		volume measured for job
joblog[1]	requested	41020	lword	0 to 99999		volume requested for job
joblog[1]	process	41022	lword	0 to 99999		process volume for job
joblog[1]	error	41024	long	0 to 999		error for job
joblog[2]	date	41026	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day
joblog[2]	time	41028	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
joblog[2]	measured	41030	lword	0 to 99999		volume measured for job
joblog[2]	requested	41032	lword	0 to 99999		volume requested for job
joblog[2]	process	41034	lword	0 to 99999		process volume for job
joblog[2]	error	41036	long	0 to 999		error for job
joblog[3]	date	41038	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day
joblog[3]	time	41040	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
joblog[3]	measured	41042	lword	0 to 99999		volume measured for job
joblog[3]	requested	41044	lword	0 to 99999		volume requested for job
joblog[3]	process	41046	lword	0 to 99999		process volume for job
joblog[3]	error	41048	long	0 to 999		error for job
joblog[4]	date	41050	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day
joblog[4]	time	41052	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
joblog[4]	measured	41054	lword	0 to 99999		volume measured for job
joblog[4]	requested	41056	lword	0 to 99999		volume requested for job
joblog[4]	process	41058	lword	0 to 99999		process volume for job
joblog[4]	error	41060	long	0 to 999		error for job

Group	Variable	Modbus Addr	Type	Values	Default	Description
joblog[5]	date	41062	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day
joblog[5]	time	41064	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
joblog[5]	measured	41066	lword	0 to 99999		volume measured for job
joblog[5]	requested	41068	lword	0 to 99999		volume requested for job
joblog[5]	process	41070	lword	0 to 99999		process volume for job
joblog[5]	error	41072	long	0 to 999		error for job
joblog[6]	date	41074	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day
joblog[6]	time	41076	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
joblog[6]	measured	41078	lword	0 to 99999		volume measured for job
joblog[6]	requested	41080	lword	0 to 99999		volume requested for job
joblog[6]	process	41082	lword	0 to 99999		process volume for job
joblog[6]	error	41084	long	0 to 999		error for job
joblog[7]	date	41086	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day
joblog[7]	time	41088	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
joblog[7]	measured	41090	lword	0 to 99999		volume measured for job
joblog[7]	requested	41092	lword	0 to 99999		volume requested for job
joblog[7]	process	41094	lword	0 to 99999		process volume for job
joblog[7]	error	41096	long	0 to 999		error for job

Group	Variable	Modbus Addr	Type	Values	Default	Description
alarmlog[0]	date	41502	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day
alarmlog[0]	time	41504	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
alarmlog[0]	FltType	41506	lword	bit logic		fault type for alarm
alarmlog[1]	date	41508	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day
alarmlog[1]	time	41510	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
alarmlog[1]	FltType	41512	lword	bit logic		fault type for alarm
alarmlog[2]	date	41514	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day
alarmlog[2]	time	41516	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
alarmlog[2]	FltType	41518	lword	bit logic		fault type for alarm
alarmlog[3]	date	41520	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day

Group	Variable	Modbus Addr	Type	Values	Default	Description
alarmlog[3]	time	41522	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
alarmlog[3]	FltType	41524	lword	bit logic		fault type for alarm
alarmlog[4]	date	41526	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day
alarmlog[4]	time	41528	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
alarmlog[4]	FltType	41530	lword	bit logic		fault type for alarm
alarmlog[5]	date	41532	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day
alarmlog[5]	time	41534	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
alarmlog[5]	FltType	41536	lword	bit logic		fault type for alarm
alarmlog[6]	date	41538	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day
alarmlog[6]	time	41540	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
alarmlog[6]	FltType	41542	lword	bit logic		fault type for alarm
alarmlog[7]	date	41544	lword	0 to 99999		date of job, byte 3=spare, 2=Year, 1=Month, 0=Day
alarmlog[7]	time	41546	lword	0 to 99999		time of job, byte 3=spare, 2=Hour, 1=Min, 0=Sec
alarmlog[7]	FltType	41548	lword	bit logic		fault type for alarm

Graco Headquarters: Minneapolis
International Offices: Belgium, China, Korea, Japan

GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440-1441
www.graco.com
Printed in USA 309871B Revised 04/2006