HI 1769-WS and HI 1769-2WS Programmers Quick Reference

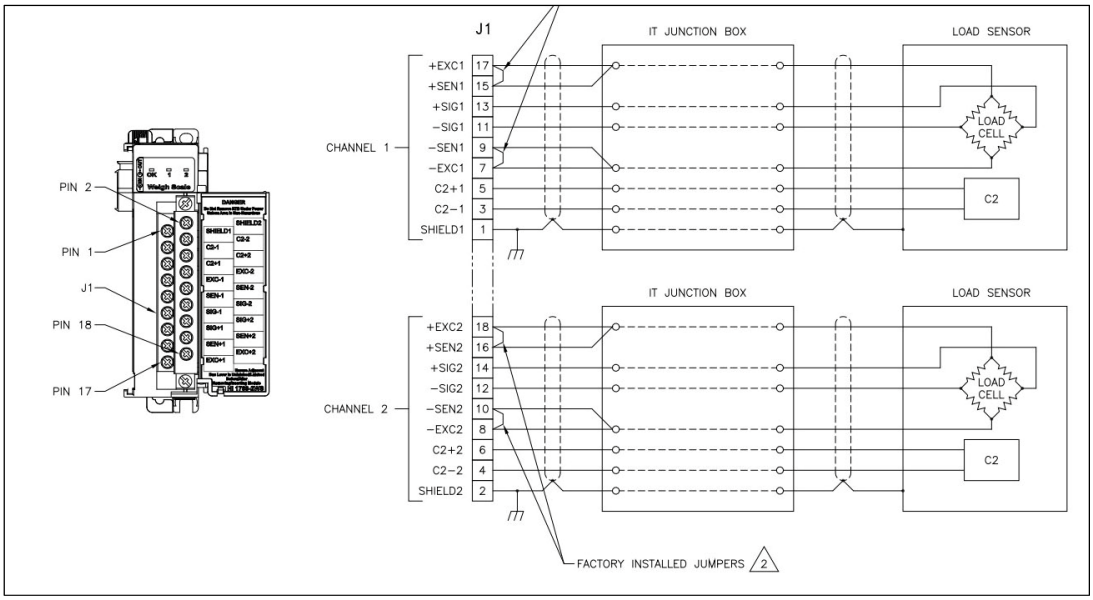
The Programmer's Quick Reference guide is intended to be a helpful and efficient reference tool for power users and technical personnel when interfacing with this Hardy product. It is not designed to replace the User's Guide.

The sample program online for CompactLogix® uses the AOP.
There are 3 individual EDS files. 1 channel (for WS), 2 channel (for 2WS) and AOP EDS.
COPY CONFIG MUST BE CHECKED in order to adjust parameters with the AOP or module reconfigure.
The configuration table downloads upon connection loss or power cycle.

LEDS	The module has a Scale LED and an OK LED associated with it. The LEDs may be green, red or off. They may be steady, Fast Flashing (5 Hertz) of Slow Flashing (1 Hertz)	
Scale Data LEDs	Steady Green	Running (Normal)
	Slow Flashing Green	Error No Calibration
	Steady Red	Error ERRORADFAILURE - (hardware induced) status bit is set.
	Flashing Red	Read AD Convert Error.
	LED is Off	Channel is not Enabled
OK Module Status LED	Fast Flashing Green	Module communicating with PLC. (Normal)
	Slow Flashing Red	Module is not Communicating with the PLC (Not Normal) Error, configuration/error in PLC addressing
NOTE:	*Slow Flashing Red appears briefly when powering up.*	

LED STATUS

Pinout:
NOTE: The HI1769 uses upside down pin labeling. The Connector for CH 1 is the same on WS and 2WS models.



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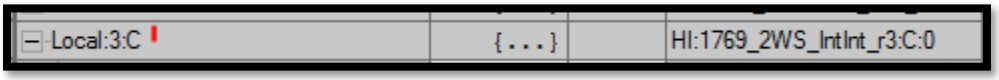
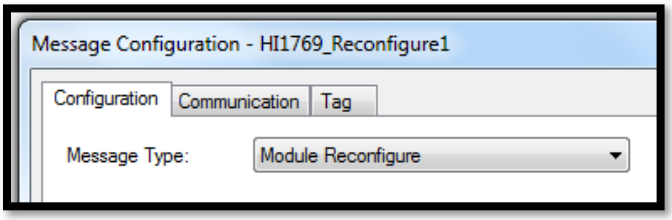
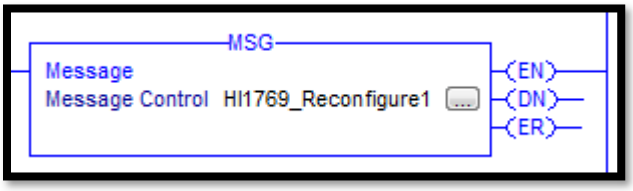
Parameter Reconfiguring:

Use the “Configuration” table to change parameters. The Configuration table is the tag list marked with a C.



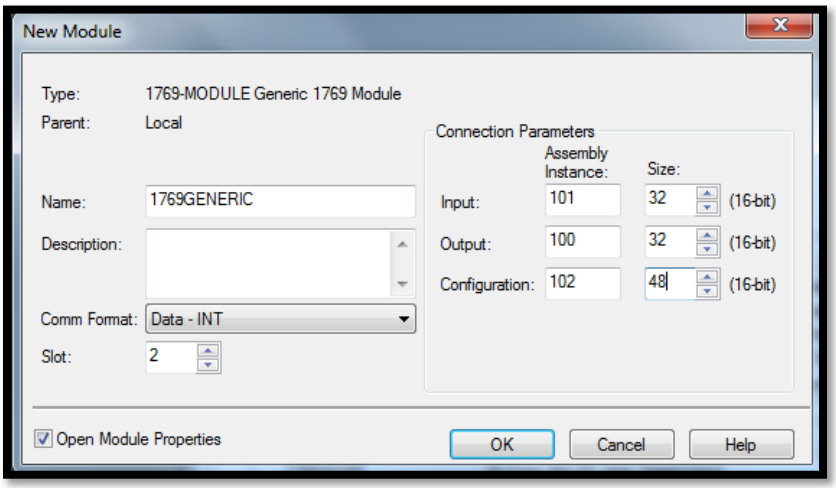
All of the parameters can be changed in this table and downloaded to the module with a Message instruction that is configured to “Module Reconfigure”.





MODULE RECONFIGURE

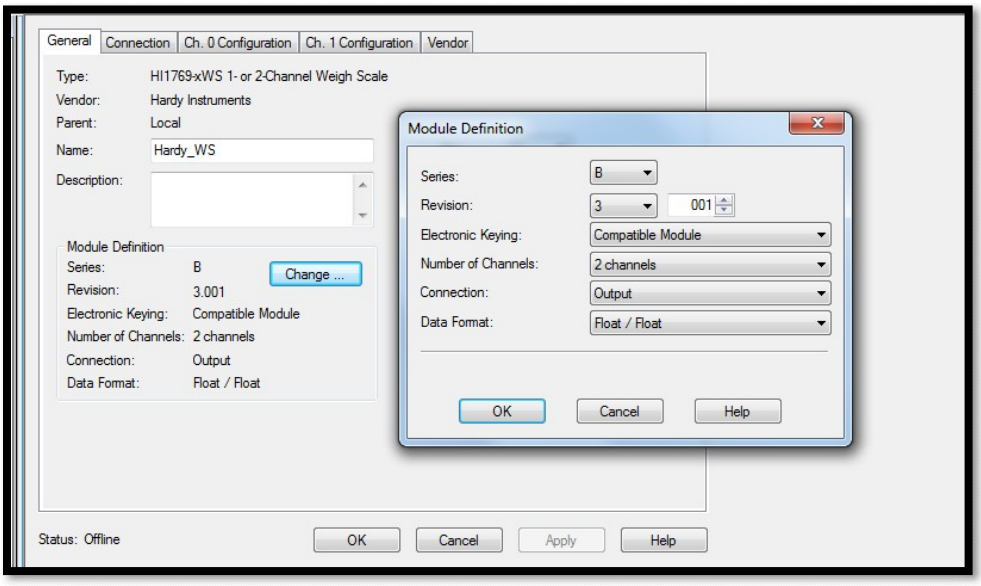
Generic Module Settings for Integer Communication:



GENERIC MODULE SETUP

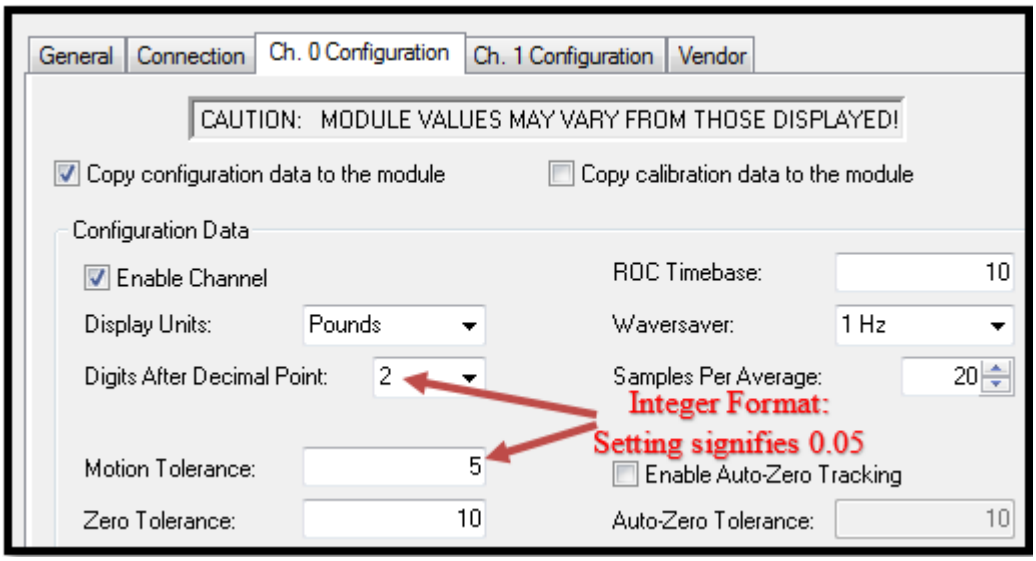
AOP Settings:

Integer/Integer or Float/Float:



AOP SETUP

Integer format has no decimal in the gross weight tag. 1 lb with 2 decimal points will come in as 100 gross weight.



Status:
Status uses words 0,1,2 whether it's Generic or AOP:

AOP:

Local:1:I.Ch1_NOCMD.CommandEcho	16#0000	Hex	INT
Local:1:I.Ch1_NOCMD.CommandStatus	0	Decimal	INT
Local:1:I.Ch1_NOCMD.ChannelStatus	16#0000	Hex	INT

STATUS INPUTS

Generic:

Local:2:I.Data[0]	16#0000	Hex	INT
Local:2:I.Data[1]	0	Decimal	INT
Local:2:I.Data[2]	16#0000	Hex	INT

Channel Status Values:

- #define ERRORADCONVERT 0x0001
- #define ERRORADFAILURE 0x0002
- #define STATUSINMOTION 0x0040
- #define ERRORNOCAL 0x0080
- #define ERROREEPROMWRITE 0x0100 // an error occurred when writing to non-volatile memory
- #define NVRDEFAULTED 0x0200 // set if SETDEFAULTPARAMS command was given
- #define STATUSCHANENABLED 0x8000 // set if channel is enabled

CHANNEL STATUSES

COMMANDS:
1 - Zero
2 - Tare
64 - Cal Low
65 - Cal High
66 – C2 Cal
69 – Read Param 0
6A – Read Param 1
94 – DEFAULT Params COMMANDS

Some of the statuses are in hex format.

Possible COMMAND STATUS Values

- #define SUCCESS 0
- #define ERRORADCONVERT 0x0001
- #define ERRORADFAILURE 0x0002
- #define STATUSINMOTION 0x0040
- #define OUTOFTOLERANCE -3
- #define INDEXOUTOFRANGE -4
- #define NOSUCHCMD -5
- #define C2FAILNODEVS -6
- #define C2FAILCAPEQ -7 // failure, capacities not equal
- #define HARDCALFAILCOUNST -8 // failure, not enough ADC counts between high, low

COMMAND STATUSES

AOP - Input

In the AOP version, input words are labeled.

Local:1:I	{...}		HI:1769_2WS_Int...
Local:1:I.Fault	2#0000...	Binary	DINT
Local:1:I.Ch0_NOCMD	{...}		HI:1769_xWS_Ch...
Local:1:I.Ch0_NOCMD.CommandEcho	16#0000	Hex	INT
Local:1:I.Ch0_NOCMD.CommandStatus	0	Decimal	INT
Local:1:I.Ch0_NOCMD.ChannelStatus	16#0000	Hex	INT
Local:1:I.Ch0_NOCMD.ADConvertError	0	Decimal	BOOL
Local:1:I.Ch0_NOCMD.ADFailure	0	Decimal	BOOL
Local:1:I.Ch0_NOCMD.InMotion	0	Decimal	BOOL
Local:1:I.Ch0_NOCMD.NoCalibration	0	Decimal	BOOL
Local:1:I.Ch0_NOCMD.WriteError	0	Decimal	BOOL
Local:1:I.Ch0_NOCMD.NVRDefaulted	0	Decimal	BOOL
Local:1:I.Ch0_NOCMD.Enabled	0	Decimal	BOOL
Local:1:I.Ch0_NOCMD.FirmwareRev	16#0000	Hex	INT
Local:1:I.Ch0_NOCMD.GrossWeight	0	Decimal	DINT
Local:1:I.Ch0_NOCMD.NetWeight	0	Decimal	DINT
Local:1:I.Ch0_NOCMD.MetricParameter	16#0000	Hex	INT
Local:1:I.Ch0_NOCMD.NumDecPlaces_0	0	Decimal	BOOL
Local:1:I.Ch0_NOCMD.NumDecPlaces_1	0	Decimal	BOOL
Local:1:I.Ch0_NOCMD.NumDecPlaces_2	0	Decimal	BOOL
Local:1:I.Ch0_NOCMD.DisplayInKg	0	Decimal	BOOL
Local:1:I.Ch0_NOCMD.CalibrationType	0	Decimal	INT
Local:1:I.Ch0_NOCMD.ADC_Counts	0	Decimal	DINT
Local:1:I.Ch0_NOCMD.ROC	0	Decimal	DINT
Local:1:I.Ch0_NOCMD.ModuleSerialNumber	0	Decimal	INT
Local:1:I.Ch0_NOCMD.ADC_ConversionCount	0	Decimal	INT

AOP INPUT TABLE

Generic Input:

Generic commands in the PLC are just an array of INTs.

Local:2:I	{...}		AB:1769_
Local:2:I.Fault	0	Decimal	DINT
Local:2:I.Data	{...}	Decimal	INT[32]
Local:2:I.Data[0]	0	Decimal	INT
Local:2:I.Data[1]	0	Decimal	INT
Local:2:I.Data[2]	0	Decimal	INT
Local:2:I.Data[3]	0	Decimal	INT
Local:2:I.Data[4]	0	Decimal	INT
Local:2:I.Data[5]	0	Decimal	INT
Local:2:I.Data[6]	0	Decimal	INT
Local:2:I.Data[7]	0	Decimal	INT
Local:2:I.Data[8]	0	Decimal	INT

GENERIC INPUT TABLE

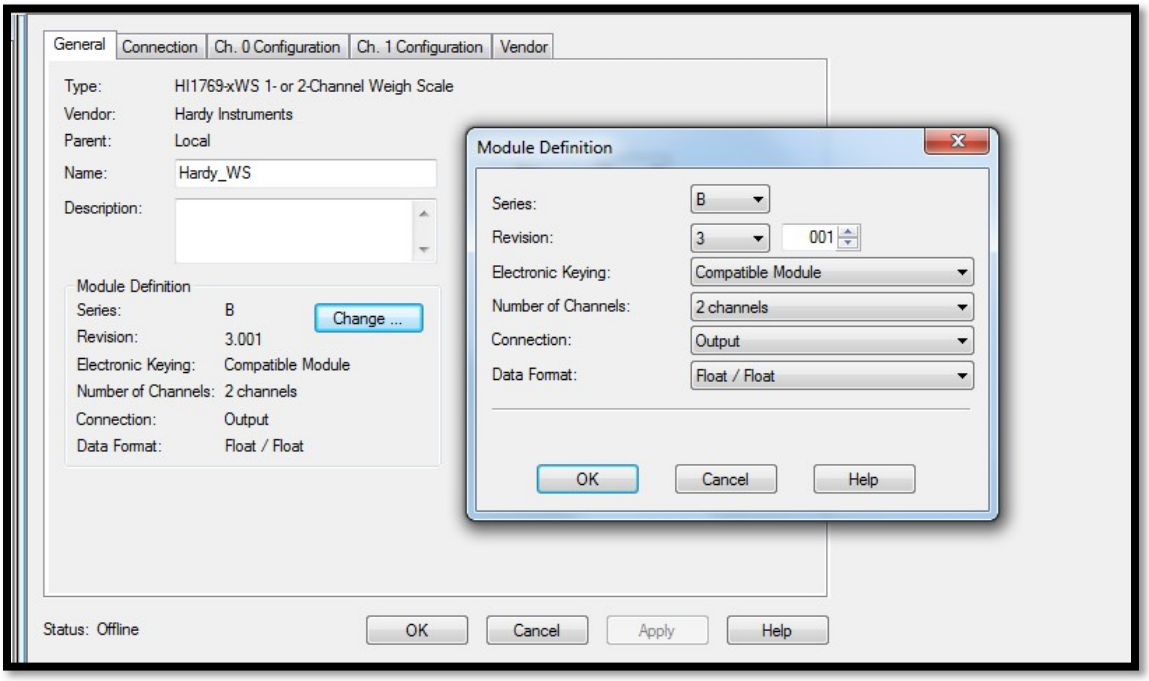
Command Table

Command	Required Output Table Values Written by User (PLC)	Input Table Response From Weigh Scale
NOCMD (no command) 0 Give this command to read weight from the module. Weight values will then be continuously updated	O:0 = 0 O:1-0:15 (unused)	I:0 = 0 I:1 = COMMAND STATUS = 0 I:2 = CHANNEL STATUSWORD I:3 = Firmware Revision I:4 = Gross Weight, LSW I:5 = Gross Weight, MSW I:6 = Net Weight, LSW I:7 = Net Weight, MSW I:8 = Metric Parameter I:9 = Calibration Type • Hard Calibration = 0 • C2 Calibration = 1 • No Calibration = 0xFFFF I:10 = ADC Counts, LSW I:11 = ADC Counts, MSW I:12 = ROC (units/min) I:13 = ROC (units/min) I:14 = Serial Number I:15 = ADC Conversion Counter

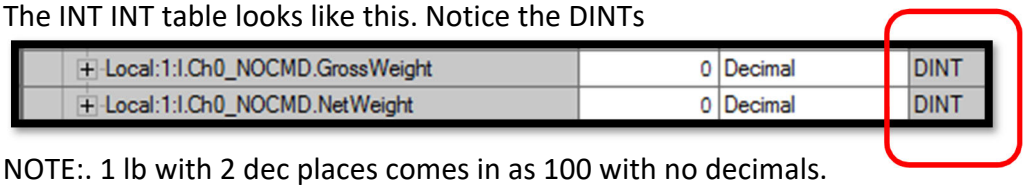
INPUT TABLE DEFINITION

AOP – Float & Integer:

The module can show Float or Integer readings depending upon the setup.

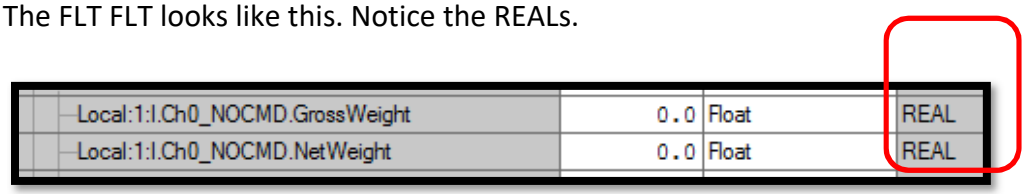


The INT INT table looks like this. Notice the DINTs



NOTE:. 1 lb with 2 dec places comes in as 100 with no decimals.

The FLT FLT looks like this. Notice the REALs.



Generic Output:
Generic is an array of INTs.

Local:2:O	{...}		AB:1769_
Local:2:O.Data	{...}	Decimal	INT[32]
Local:2:O.Data[0]	0	Decimal	INT
Local:2:O.Data[1]	0	Decimal	INT
Local:2:O.Data[2]	0	Decimal	INT
Local:2:O.Data[3]	0	Decimal	INT
Local:2:O.Data[4]	0	Decimal	INT
Local:2:O.Data[5]	0	Decimal	INT

GENERIC OUTPUT TABLE

AOP Output:
AOP is an array of INTS for each channel.

Local:1:O.Ch0	{...}		HI:1769_xWS
Local:1:O.Ch0.Command	16#0000	Hex	INT
Local:1:O.Ch0.Data01	0	Decimal	INT
Local:1:O.Ch0.Data02	0	Decimal	INT
Local:1:O.Ch0.Data03	0	Decimal	INT
Local:1:O.Ch0.Data04	0	Decimal	INT
Local:1:O.Ch0.Data05	0	Decimal	INT
Local:1:O.Ch0.Data06	0	Decimal	INT
Local:1:O.Ch0.Data07	0	Decimal	INT

AOP OUTPUT TABLE

Read Params: 69 or 6A command. Example of input word.

Command	Required Output Table Values Written by User (PLC)	Input Table Response From Weigh Scale
READPARAM0 0x69 Read a parameter block. Weight values are formatted according to the Metric parameter.	O:0 = 0x69 O:1-O:15 = unused	I:0 = 0x69 I:1 = 0 I:2 = ChanActive I:3 = Metric I:4 = WAVERSAVER I:5 = NumAverages I:6 = ZeroTrackEnable I:7 = ROCtimebase I:8 = AutoZeroTolerance, LSW I:9 = AutoZeroTolerance, MSW I:10 = MotionTolerance, LSW I:11 = MotionTolerance, MSW I:12 = ZeroTolerance, LSW I:13 = ZeroTolerance, MSW I:14-I:15 = unused
READPARAM1 0x6A Read a parameter block. This block contains some non-user settable calibration parameters zerocount = A/D counts at the last ZEROCMD calzerocount = A/D counts at zero weight, as obtained at the last calibration CalLowCount: A/D counts at CalLowWeight CalHighCount: A/D counts at Span Weight (Hard Calibration only)	O0 = 0x6A O:1-O:15 = unused	I:0 = 0x6A I:1 = 0 I:2 = tareweight LSW I:3 = tareweight MSW I:4 = SpanWeight LSW I:5 = SpanWeight MSW I:6 = CalLowWeight, LSW I:7 = CalLowWeight, MSW I:8 = zerocount, LSW I:9 = zerocount, MSW I:10 = calzerocount, LSW I:11 = calzerocount, MSW I:12 = calLowCount, LSW I:13 = calLowCount, MSW I:14 = calHighCount, LSW I:15 = calHighCount, MSW

READING PARAMETERS

Writing Parameters:

Read your parameters first.

They will show up in the read params table.

NOTE: There are two different read and write tables. One set for using REAL/Floating point and one for using INT/Integers. They are designated with INT or FLT.

Read_Flt_param_0	{...}
Read_Flt_param_0.ChanActive	1
Read_Flt_param_0.Metric	16#0040
Read_Flt_param_0.Waversaver	2
Read_Flt_param_0.NumAverages	10
Read_Flt_param_0.ZeroTrackEnable	0
Read_Flt_param_0.ROC_Time_Base	0
Read_Flt_param_0.AutoZeroTol	10.0
Read_Flt_param_0.MotionTol	3.0
Read_Flt_param_0.ZeroTol	3.0
Read_Flt_param_0.unused1	0
Read_Flt_param_0.unused2	0

Copy the parameters that were just read to the write params table and change the parameter you want and THEN dump them back in with a write param command.

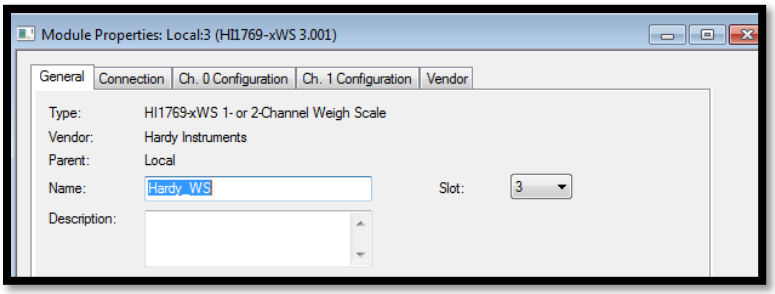
write_flt_param_0	{...}
write_flt_param_0.ChanActive	1
write_flt_param_0.Metric	16#0040
write_flt_param_0.Waversaver	2
write_flt_param_0.NumAverages	10
write_flt_param_0.ZeroTrackEnable	0
write_flt_param_0.ROC_Time_Base	0
write_flt_param_0.AutoZeroTol	10.0
write_flt_param_0.MotionTol	3.0
write_flt_param_0.ZeroTol	3.0
write_flt_param_0.unused1	0
write_flt_param_0.unused2	0

Then read again to verify the changes that were made.

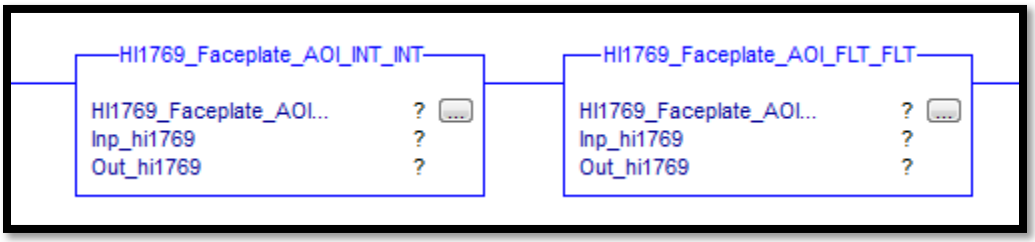
Command	Required Output Table Values Written by User (PLC)	Input Table Response From Weigh Scale
WRITEPARAM0 0x67 Write a block of parameters: To write a single parameter: Step 1. Do a READPARAM0 command. Step 2. Copy the parameters read to the output. Step 3. Change the parameter value Step 4. Set the command word. The Metric Parameter is processed last, which means that all parameters are interpreted according to the old Metric value. Results are saved to non-volatile memory. If you attempt to set a parameter value to an illegal value, the offset of that parameter will appear in the COMMAND STATUS word.	O:0 = 0x67 O:1 = unused O:2 = ChanActive O:3 = Metric O:4 = WAVERSAVER O:5 = NumAverages O:6 = ZeroTrackEnable O:7 = ROCtimebase (1-1800 sec) O:8 = AutoZeroTolerance, LSW O:9 = AutoZeroTolerance, MSW O:10 = MotionTolerance, LSW O:11 = Motion Tolerance, MSW O:12 = ZeroTolerance, LSW O:13 = ZeroTolerance, MSW O:14-O:15 = unused	I:0 = 0x67 I:1 = COMMAND STATUS I:2-I:15 See READPARAM0
WRITEPARAM1 0X68 If you attempt to set a parameter value to an illegal value, the offset of that parameter will appear in the COMMAND STATUS word.	O:0 = 0x68 O:1 = unused O:2 = TareWeight LSW O:3 = TareWeight MSW O:4 = SpanWeight LSW O:5 = SpanWeight MSW O:6 = CalLowWeight LSW O:7 = CalLowWeight MSW O:8-O:15 = unused	I:0 = 0x68 I:1 = COMMAND STATUS I:2-I:15 See READPARAM1

MANUALLY WRITING PARAMETERS

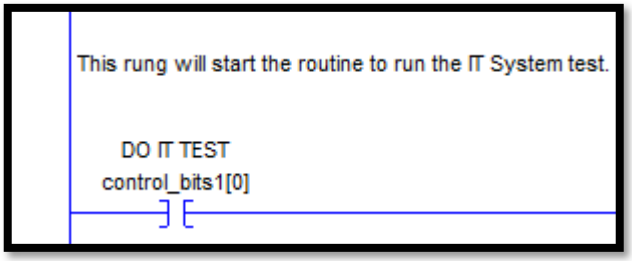
Sample Program:
The Sample Program is setup for use with the AOP.
It's important to change the slot number in the sample program first and THEN copy the routines over.
So all the referencing to LOCAL1, as well as other references, changes to the correct slot.
Another way to reference the data to the correct slot is to import it into the AOP program.



AOIs:
The command word can be cross-referenced to see where each command number is used.
AOIs can have FLOAT or INT types.
The input and output may not show up in the AOIs.
Try changing the modules to INT INT or FLT FLT in the AOP to get the inputs and outputs to show up.



IT Test:
Toggle the IT test bit in the mainroutine.

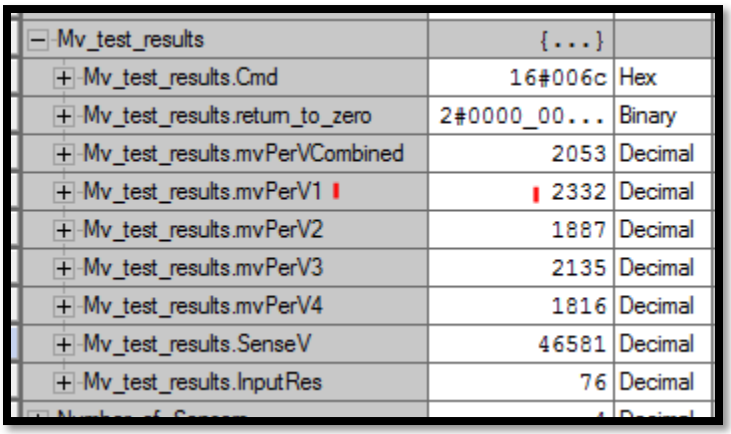


The IT test takes about 30 seconds.

The mV/V data is shown in the Mv_test_results tag.

The mV/V data is displayed as an integer. Actually, it needs to be converted to a decimal with 4 decimal places.

For example, 2332 = 0.2332 mV/V



Mv_test_results	{...}	
Mv_test_results.Cmd	16#006c	Hex
Mv_test_results.return_to_zero	2#0000_00...	Binary
Mv_test_results.mvPerVCombined	2053	Decimal
Mv_test_results.mvPerV1	2332	Decimal
Mv_test_results.mvPerV2	1887	Decimal
Mv_test_results.mvPerV3	2135	Decimal
Mv_test_results.mvPerV4	1816	Decimal
Mv_test_results.SenseV	46581	Decimal
Mv_test_results.InputRes	76	Decimal

SAMPLE PROGRAM IT TEST

To translate the mV/V readings to mV, multiply by 5. For example, 0.2332 mV/V times 5 is 1.166 mV.