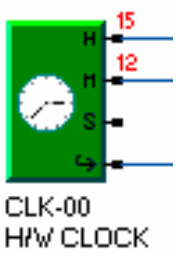
Object 12- Clock

Clock Summary

Overview: The clock object provides other objects with access to the current time, day, date, month, and year, and whether currently in a holiday or a special day. The clock object may also be used to broadcast this information periodically to others on the system bus.



Hardware Clock: The, ASIC/2, SINC/3, and SINC/2 controller are shipped with a battery-backed hardware clock. The hardware clock is used to periodically update the software clock. The hardware clock is set via communications. The hardware clock returns the current time, day, date, month, and year and accommodates leap years. The Time Keeper will read the hardware clock once an hour. If the controller is not a TimeKeeper, the hardware clock is only read at power up.

Software Clock: The internal operation of the controller is based on the software clock which is updated every second. For the SINC/3 and ASIC/2-7540 the software clock is based on an internal crystal. For the ASIC/2-7040 and ASIC/2-8040 the software clock is based on counting the 60 Hz or 50 Hz line frequency.

Daylight Savings: The clock may be configured to perform daylight savings time adjustments: the clock will spring forward at 2 a.m. on the 1st Sunday in April and fall back one hour on the last Sunday in October.. With FW300b3.0 and 7/854a1.5 the default Daylight savings dates are changed for year 2007 onward to 2nd Sunday in March and First Sunday in November. The ability to add custom dates is also included.

Holiday Schedule: The clock object contains a 20 holiday schedules with the month, date, and number of days up to 15 days. If the holiday schedule is enabled, these are scanned periodically and the clock's holiday status is set accordingly. The holiday status can also be set in the Calendar object using special days. Typically, only one controller on the network is configured to examine its holiday schedule. The other controllers listen for the holiday status on the communication line.

Special Days: If Special Day Enable is Yes, then the clock examines all indices of the Calendar object to see if any special days or holidays are active. If any of these special days are enabled and active in the calendar, then the Active Special Day number is set in the clock.. The broadcast of special day by others is ignored and the local calendar is used to determine special day and holiday conditions. Special Days has priority over the Holiday Schedule.

To receive special days or holidays on communication line Special Day Enable must be No. The Active Special Day may then be set with communication using a ASIC/2 Time message.

Broadcast of Time: A Time Keeper may broadcast ASIC/2 Time (MT= 0x3F, M1=1), and/or ASIC/1 Time (MT=0x38), on the system bus. Typically, one controller on the system bus is configured to transmit its clock time to keep the network sysnchronized. The Broadcast object is used to broadcast ASIC/1 Time on the local bus of the ASIC/2 or SINC/3 to synchronize the ASIC/1 controllers after power outage.

Clock Operation

The clock object provides other objects with access to the current time, day, date, month, and year, and whether currently in a holiday or special day. The clock object may also be used to broadcast this information periodically to others on the system bus.

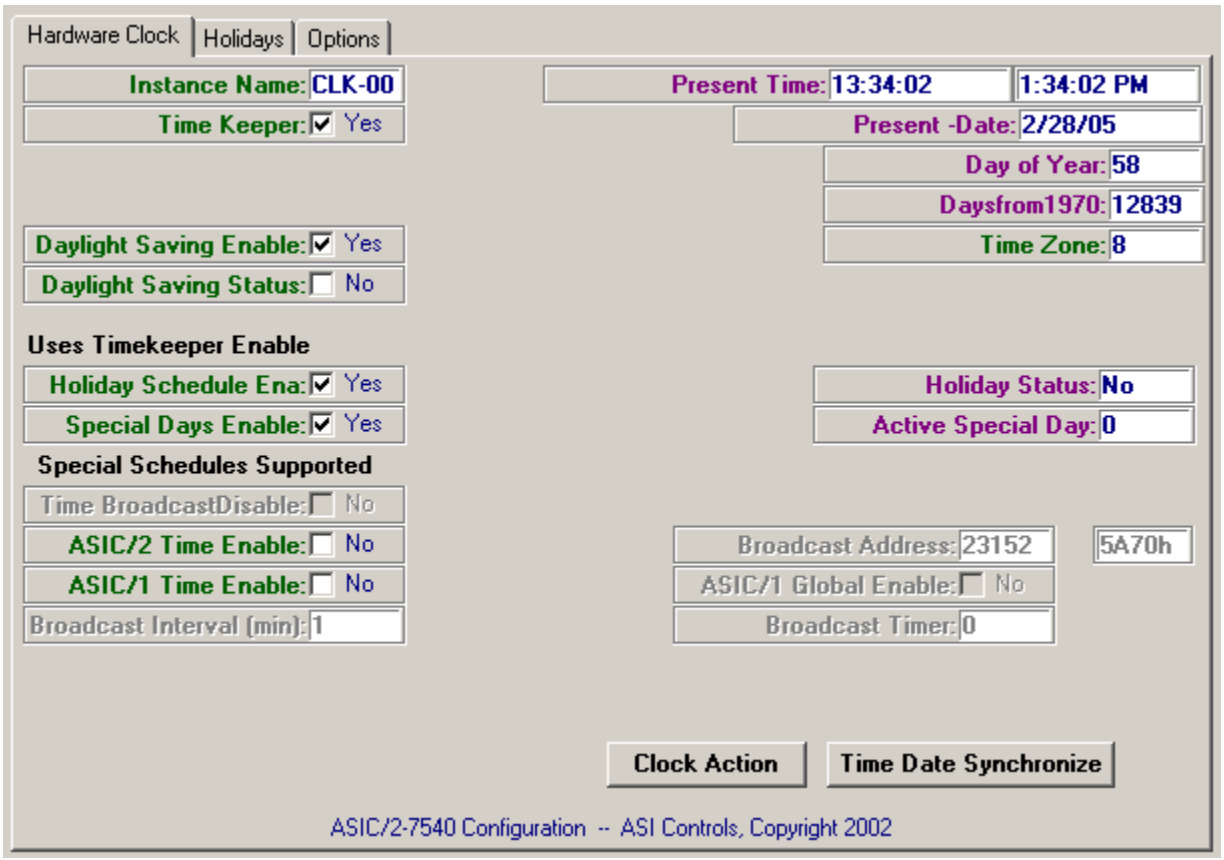
A hardware clock is used to periodically update the software clock. Once set the hardware clock returns the current time, day, date, month, and year and accommodates leap years

The Hardware Clock is always updated whenever there is a ASIC/2 Time message (MT=0x3F, M1=1) addressed to its Device or Global Address.

The internal operation of the controller is based on the software clock. If Time Keeper Enable is Yes, the software clock is updated from the hardware clock once an hour, at 11 minutes and 13 seconds after the hour, a time that does not conflict with any controller events. If Time Keeper Enable is No, the hardware clock is only read at power up.

The software clock is corrected for leap year by reading the hardware clock on 1 March at 1 AM. If the date is found to be 29 February, then the software clock is corrected.

The Day of Year and Days from 1970 are calculated when the hardware clock is read and placed in the Utility instance 0. TimeKeeper Enable must be yes for these to update.

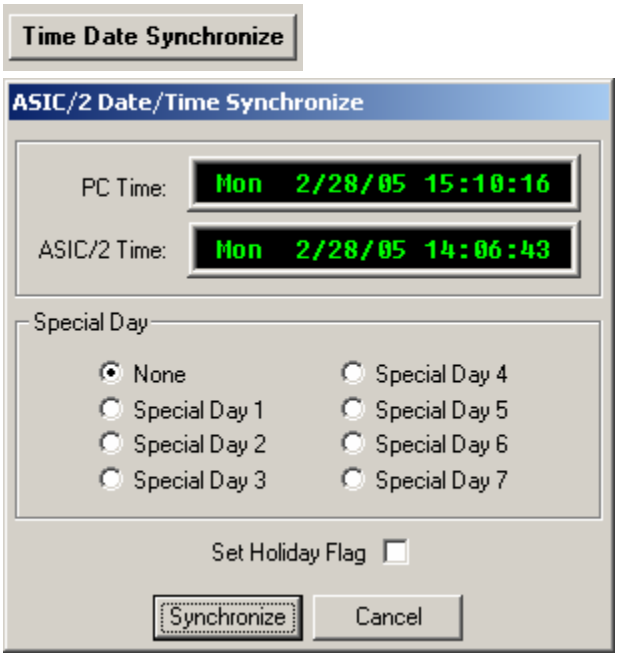


In earlier versions (before ASIC/2-7040 FW740C Rev 2.0 and ASIC/2-8040 FW840C Rev 1.0) Hardware Clock Enable is used and must be Yes to read the Hardware Clock.

The software clock is frequently updated from the hardware clock. If Update Clock Enable is Yes, then the hardware clock time will be updated whenever a ASIC/2 Time message (MT=0x3F, M1 = 1) is received on the communication line. If Update Clock Enable is not set, then the ASIC/2 Time message is ignored.

Time Synchronize

The hardware clock can be set to the present PC Time using the ASIC/2 Date/Time Synchronize message in ASI Expert software.



Daylight Savings

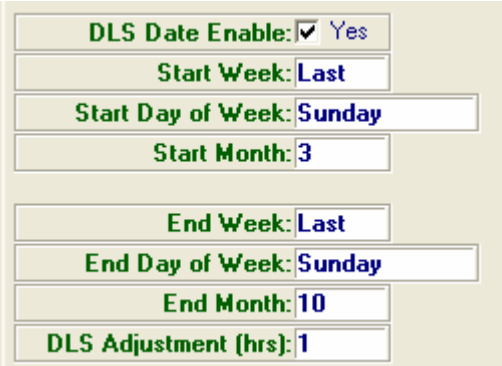
The controller can automatically compensate for daylight savings time using an internal calculation. If the Daylight Savings Enable is Yes, the hardware clock will Spring forward one hour at 2 AM on the 1st Sunday in April, setting Daylight Savings Status to Yes. The hardware clock will Fall back one hour at 2 AM on the last Sunday in October, setting Daylight Savings Status to No. With FW300b3.0 and 7/854a1.5 the default Daylight Savings dates are changed for year 2007 onward to 2nd Sunday in March and First Sunday in November.

The controller must pass through the proper date and time for it to be in effect. The Daylight Savings Enable and Status flags are static data which are preserved through power reset.

Note: If the controller is in Daylight Savings when you set it up, you must set both Daylight Savings Enable and Daylight Savings Status to Yes.

Custom Date

The ability to add custom dates is also included. With FW300b3.0 and 7/854a1.5. If DLS Date Enable is Yes, then the controller uses the configured start and end dates to determine when the controller is in Daylight Savings. The user indicates Start/End Week 1st, 2nd, 3rd, 4th, or Last; the Day of the Week, Monday, …, Sunday; a Month 1= January, through 12 = December; and an Adjustment Time of 1 or 2 hours.



The daylight savings adjustment is always done at 2:00 AM (02:00 hrs) on the indicated day.

> Note: The updated time will be broadcast on the system bus at the next regular broadcast interval.

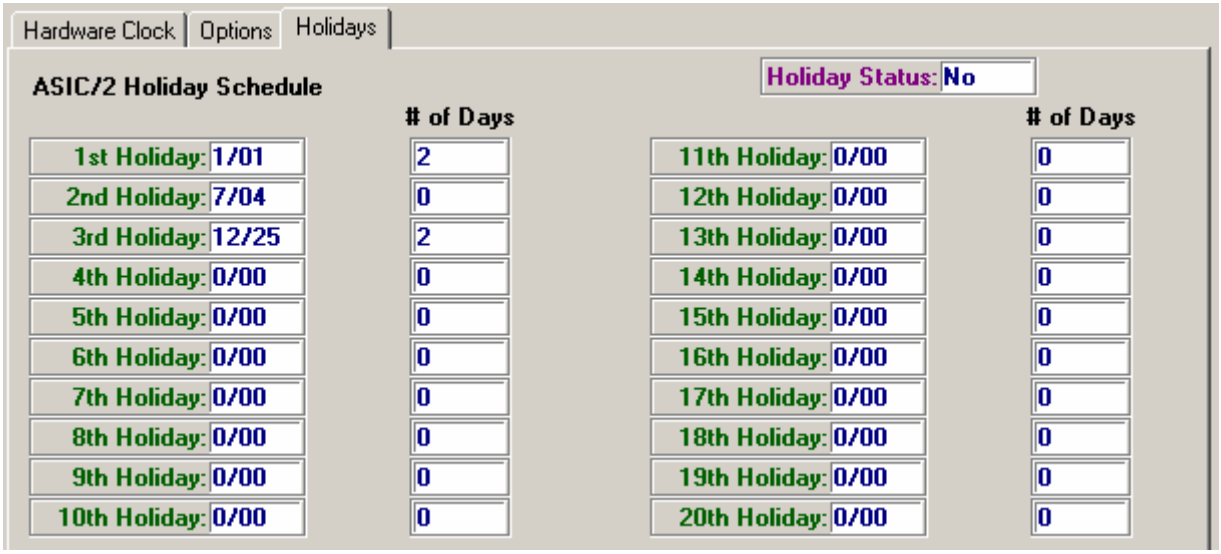
Time Zone

A Time Zone parameter is available to identify the time zone. Together with the Daylight Savings Status you can determine the actual time, Eastern Daylight Time, Pacific Standard Time, etc., that is kept in the controller. This can be important when monitoring controllers remotely that are in a different time zones.

The controller does not use the time zone parameter. The geographical time zone (signed) is based on Greenwich: -5, Eastern Standard Time; -6 ,Central Standard Time; -7 ,Mountain Standard Time; -8 ,Pacific Standard Time ; -10 ,Pacific Island Standard Time; etc.

Holiday Schedule

The clock object contains a 20 holiday schedules with the month, date, and number of days up to 15 days for the holiday period. If the number of days is 0 or 1, then the single month and date will be a holiday. If the number of dayis from 2 to 15, then the month and date and the following days will all be holidays. This allows a block of days to be declared as holidays.



If the Holiday Schedule Enable is Yes, the controller scans the holiday schedules periodically to determine if the present day is a holiday. If so, it sets the Holiday Status to Yes.

The Holiday Status can also be set in the Calendar object using special days.

If the Holiday Schedule Enable and Special Days Enable are No, the controller waits for an ASIC/2 Time message on the network to determine its holiday status. Typically, only one controller on the network is configured to examine its holiday schedule. The other controllers listen for the holiday status on the communication line.

Each Holiday Schedule includes:

LO BYTE = Holiday - Date (1..31)
HILSNBL = Holiday - Month (1..12)
HIMSNBL = Holiday - Number of Days (1..15).

Earlier versions (before ASIC/2-8040 FW840A. ASIC/2-7040 FW740A) did not include the number of days.

Special Day Events

Based on the operation of the clock and calendar object, a day can be declared a special day 1 through 7. Special Day Enable must be set to Yes, and the Calendar object must be configured for a listing of special days. The Active Special Day indicates that today is a special day, 1 through 7, as defined by the Calendar object, or 0 = Normal Day. The special day activates a special schedule event in the Schedule object.

The Active Special Day may be set with communication using an ASIC/2 Time message. If Special Day Enable is No, the controller can accept a special day from a time broadcast message from another controller, or from a host, provided the Special Day field in the messasge has been set.

To receive special days or holidays on communication line CLK Special Day Enable must not be set in the controller. The special day schedule takes priority over the Holiday schedule.

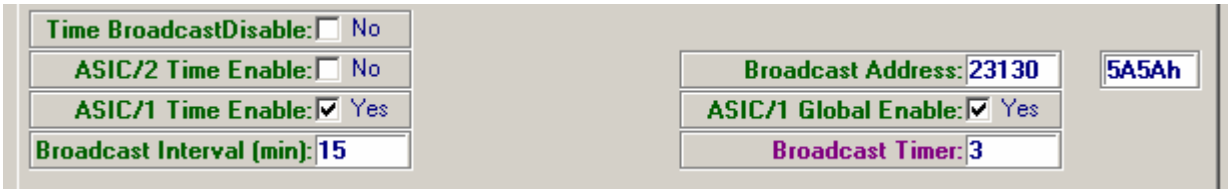
Time Broadcast

A Time Keeper may broadcast ASIC/2 Time (MT= 0x3F, M1=1), and/or ASIC/1 Time (MT=0x38), on the system bus. Typically, one controller on the system bus is configured to transmit its clock time to keep the network sysnchronized.

Only a Time Keeper may Broadcast Time, MT=0x3F, M1=1 or MT=0x38 on the system bus. Broadcast of Time will work in both token and non-token mode.

To synchronize other ASIC/2 or SINC/3 controllers on the system bus set ASIC/2 Time Enable to Yes. The broadcast address is typically 23152 (0x5A70) The Broadcast Interval can be 15 minutes to 240 minutes. Time Broadcast Disable in the System Object must be set to No.

To synchronize other ASIC/1 controllers on the system bus set both ASIC/1 Time Enable and ASIC/1 Global Address Enable to Yes. It will broadcast to the ASIC/1 global address 23130 (0x5A5A) at the Broadcast Interval. You may use both ASIC/1 and ASIC/2 Time Enable at the same time. .



Non -Token Bus Enable is not used by SINC/3, or 740C2.0, 840C1.0 and later. For earlier versions .it indicates that the system controller is part of a non-token passing bus and allows time broadcast on the system bus in the absence of token traffic.

Broadcast of ASIC/1 Time on the local bus of the ASIC/2 or SINC/3 is accomplished with a properly configured broadcast object to synchronize the ASIC/1 controllers after power outage.

Clock Glossary

Clock Parameters

50 Hz Enable

Identifies the line frequency used for keeping time. 1 = 50 Hz; 0 = 60 Hz
(12,0,6, HI bit 1) (Not Used ASIC/2-7540)

Active Special Day

Indicates that today is a special day, 1 through 7, as defined by the Calendar object. 0 = Normal Day. (12,0,0,HILSNBL,)

ASIC/1 Time Enable (MT=0x38)

Enables broadcaster of the ASIC/1 Time on the communications bus using the MT=0x38 message. The software clock value for the time is used for broadcasts. Yes, No; user-configurable. (12,0,6,LOBIT 2)

ASIC/2 Time Enable (MT=0x3F, M1=1)

Enables broadcaster of the ASIC/2 Time on the system bus using the 3Fh, M1=1 message. The software clock value for the time is used for broadcasts. Yes, No; user-configurable. (12,0,6,LOBIT 1)

Broadcast Address

The destination address to be used in broadcast messages of the Clock's time on the system bus. User-configurable; (12,0,8,WORD)

Broadcast Interval(mins)

The time interval between successive broadcasts on the system bus of the Clock's time. User-configurable; in minutes. (12,0,7,LOBYTE)

Broadcast Time Now

Indicates that it is time to broadcast the time on the system bus. Reset to No following a broadcast. Not user-changeable; Yes, No. (12,0,0,HIGH BIT 7)

Broadcast Timer

Used to time Broadcast Interval. Not user-changeable; reads in minutes. (12,0,5,HIBYTE)

Clock Action

Writing to this Clock attribute (12,0,4,WORD) causes the corresponding action to occur:
0 No Action
1 Update Holiday Now: Forces the Controller to perform an immediate check of its internal holiday schedule to see if it is currently in holiday.
2 Set 50 Hz; 3 Set 60 Hz
4 Read Hardware Clock Now (diagnostic)
5..11 Override Active Special Day = 1..7 (FW740C..)
12 Override Active Special Day = 0, Clear (FW740C..)

Clock Status

Shows the momentary internal flags for clock operation.

Daylight Savings Time Enable

Enables the automatic Daylight Savings feature. The clock will Spring forward at 2 a.m. on the 1st Sunday in April and Fall back one hour on the last Sunday in October. Yes, No. (12,0,6,LOBIT 7)

Daylight Savings Time Status

Indicates if the Clock is currently observing daylight savings time. Yes, No; user-configurable. (12,0,6,HIGH BIT 0)

DLS Adjustment

Adjustment interval for Custom Daylight Savings. 1hr, 2hr. (12,0,6,HIBit4) (FW7/854a1.5, FW300b3.0)

DLS Date Enable

Enables the Custom Start and End dates for Daylight Savings. (12,0,6,HIBit4) (FW7/854a1.5, FW300b3.0)

End Day of Week

End Day of Week for Custom Daylight Savings - 0,1=Mon, ..7=Sun (FW7/854a1.5, FW300b3.0) (12,0,30,HI_LSNBL)

End Month

End Month for Custom Daylight Savings - 0 = default, 1..12 [Jan .. Dec] (12,0,30,LO_LSNBL) (FW7/854a1.5, FW300b3.0)

End Week

End Week for Custom Daylight Savings - 0,1 =First, 2=Second, 3=Third, 4=Fourth, 5=Last (FW7/854a1.5, FW300b3.0) (12,0,30,LO_MSNBL)

Hardware Clock Enable

Hardware Clock Enable is used and must be Yes to read the Hardware Clock. Yes, No; user-configurable. (12,0,6,LOBIT 0) Earlier versions Only (before ASIC/2-7040 FW740C Rev 2.0 and ASIC/2-8040 FW840C Rev 1.0)

Holiday Schedule Enable

If the Holiday Schedule Enable is Yes, the controller scans the holiday schedules periodically to determine if the present day is a holiday. Yes, No; user-configurable. (12,0,6,LOBIT 4)

In Holiday

This internal flag indicates that a holiday is currently in effect. It can be set by the Holiday Schedule, a Calendar Event, or an ASIC/2 Time message. Changes to No at midnight upon completion of a holiday. Yes, No. (12,0,0,LOBIT 7)

Non-Token Bus Enable

Indicates that the system controller is part of a non-token passing bus, in which it is periodically polled by a building management system for information. Yes, No; user-configurable. (12,0,6,LOBIT 6) [Typical, No] Not used by SINC/3, 740C2.0, 840C1.0 and later.

Present Date

The date given by the software clock YY-MM-DD.

Present Day of Month

Equal to the software clock value for the date. Integer 1...31; not user-changeable. (12,0,3,HIBYTE)

Present Time

The time given by the software clock HH:MM:SS.

Present Time - Day of the Week

Equal to software clock value for the current day of the week. "Monday", ..., "Sunday" 1..7); not user-changeable. (12,0,2,HIBYTE)

Present Time - Hour

Indicates the software clock value for the hour (expresses in the 24-hour time system). Not user-changeable; integer 0 to 23. (12,0,2,LOBYTE)

Present Time - Minute

Indicates the software clock value for minute of the hour. Not user-changeable; integer 0..59. (12,0,1,HIBYTE)

Present Time - Month

Indicates the software clock value for the month. Not user-changeable; integer 1 to 12. (12,0,3,LOBYTE)

Present Time - Second

Indicates the software clock value for second of the minute. Not user-changeable; integer 0..59. (12,0,1,LOBYTE)

Present Time - Year

Indicates the software clock value for the year. Not user-changeable; integer 00 to 99. (12,0,5,LOBYTE)

Special Days Enable

If set to Yes, then Clock examines all indexes of the Calendar object to determine if it is a special day. (12,0,6,HIBIT 3)

Start Day of Week

Start Day of Week for Custom Daylight Savings - 0,1=Mon, ..7=Sun (FW7/854a1.5, FW300b3.0) (12,0,29,HI_LSNBL)

Start Month

Start Month for Custom Daylight Savings - 0 = default, 1..12 [Jan .. Dec] (12,0,29,LO_LSNBL) (FW7/854a1.5, FW300b3.0)

Start Week

Start Week for Custom Daylight Savings - 0,1 =First, 2=Second, 3=Third, 4=Fourth, 5=Last (FW7/854a1.5, FW300b3.0) (12,0,29,LO_MSNBL)

Time Keeper Enable

If Time Keeper Enable is yes, the software clock is updated from the hardware clock once an hour, at 11 minutes and 13 seconds after the hour, a time that does not conflict with any controller events. If Time Keeper Enable is No, the hardware clock is only read at power up. (FW 740C2.0 , 840C1.0 and later)

Time Zone

Indicates the time zone for the geographical region in which this controller is located. User-configurable; integer. (12,0,7,HIBYTE)

Update Clock Enable

If set to Yes, then the Clock updates its hardware clock or software clock based on the time contained in ASIC/2 Time messages (MT=0x3F, M1 = 1) broadcast on the communications bus. Yes, No;. (12,0,6,LOBIT 3) Not used by SINC/3, Not Used 740C2.0, 840C1.0 and later.

XXth Holiday - Date

Indicates the date for the XXth holiday (XX is from 1 to 20) in the Clock's internal holiday schedule. Integer 1..31; user-configurable. (12,0,9...28,LOBYTE)

XXth Holiday - Month

Indicates the month for the XXth Holiday (XX is from 1 to 20) in the Clock object's internal holiday schedule. For ASIC/2-8040 FW840A.. , Values 1 through 12 correspond to months January Through December. (12,0,9...28,HILSNBL,)

XXth Holiday - Number of Days

Indicates the number of holidays starting with the holiday date for the XXth Holiday (XX is from 1 to 20). 0 or 1 is a single the holiday. Integer 0..15; user-configurable. (12,0,9...28,HIMSNBL)

Clock Properties

Object Name	CLOCK
Object Number	12
Data Type	Word
Index	0 Only one allowed
Attribute	29 (0..28)
DYNAMIC Attributes	6 (0..5)
STATIC Attributes	24 (6..29)
STATIC Attributes	28 (6..33) (FW7/854a1.5, FW 300b3.0)

Clock Firmware Revision

ASIC/2-7040 FW740E Rev 2.9b Released 2007-03-26 CHK 0xC8EB
ASIC/2-8040 FW840E Rev 2.9b Released 2007-03-27 CHK 0xA68B

- Updates Daylight Savings to new standard dates
  Spring Forward: 2nd Sunday March 2:00 AM
  Fall Back: 1st Sunday November 2:00 AM

ASIC/2-7540 FW754a Ver 1.5m Release 2006-05-02
ASIC/2-8540 FW854a Ver 1.5m Release 2006-05-02
SINC/3-3000 FW300B Rev 3.0c Released 2006-04-27 CHK 0xE5E6 PN 70015-05

- Updates Default Daylight Savings Dates
- Adds Custom Daylight Savings Date feature.

Note: The Clock size has changed so you must reload your application.

ASIC/2-7040 FW740E Rev 2.7h Released 2005-01-14 CHK 0xD2F6 PN70002-16
ASIC/2-8040 FW840E Rev 2.7h Released 2005-01-18 CHK 0xAE98 PN70006-13

- Fixes occasional problem with writes to Hardware Clock when polling.
  Makes Daylight Savings update more reliable.

SINC/3-3000 FW300B Rev 2.1 06/18/2001 CHK 0xD16A -- ASI PN 70015-01

- Fixes CLOCK minute and hour flag so that events are not missed
  when controller is synchronized.
  Fixes synchronize, MT=3Fh so that minute is correct.
- Improves Modem/Direct Contention for System Bus.

ASIC/2-7040 FW740C Rev 2.7 Released 12/11/2000 CHK 0x69A6
ASIC/2-8040 FW840C Rev 1.7 Released 12/11/2000 CHK 0x66F7
ASIC/2-8040 FW840E Rev 2.0 Released 12/15/2000 CHK 0xF6C1
ASIC/2-7040 FW740E Rev 2.0 Released 12/15/2000 CHK 0x181F
SINC/3-3000 FW300B Rev 2.0 Released 12/15/2000 CHK 0xDDAD

- Improved minute flag in clock to be more robust when being synchronized.
  Hardware Clock read at 11min:13 sec after hour.

SINC/3-3000 FW300B Rev 1.8 Released 10/05/2000 CHK 0xCB3B

- Software Clock adjusted to be more accurate
  between hourly hardware clock reads.

SINC/3-3000 FW300B Rev 1.2 Released 01/13/2000 CHK 0xBE11

- Fixes Clock problem 26-31 December which cause clock to reset to zero.

ASIC/2-7040 FW740C Rev 2.6 Released 09/15/99 CHK 0x6AB1
ASIC/2-8040 FW840C Rev 1.6 Released 09/15/99 CHK 0x69EE

- Allows hardware clock to be read at power-up when the
  Polling Pause Time is 0. Worked OK if Pause Time is 1.

ASIC/3-3000 FW300A Rev 1.0 Released 07/27/99

- Initial release of the SINC/3.

ASIC/2-8040 FW840C Rev 1.2 Released 09/18/98 CHK 6931h
ASIC/2-7040 FW740C Rev 2.2 Released 09/18/98 CHK 68E9h

- Fixes Synchronize Flag in System Object SYS-0,Attr-0,LOBit0
  does not get set on reset in 740C 2.0, 2.1 and 840C 1.0,1.1

ASIC/2-7040 FW740C Rev 2.1 08/20/98
ASIC/2-8040 FW840C Rev 1.1 07/22/98

Fixes roll-over of year.

ASIC/2-7040 FW740C Rev 2.0 Released 06/05/98 Chk0D54h
ASIC/2-8040 FW840C Rev 1.0 Release 06/05/98

- The operation of the ASIC/2-7040 FW740C 2.0 and ASIC/2-8040 FW840C 1.0 are now unified
- The operation of the Hardware Clock has been changed. Hardware Clock Enable is redefined as Time Keeper Enable.
- With this version the Hardware Clock is always updated whenever there is a MT=0x3F, M1=1 message. On older versions Update Enable should always be set so that the time can be updated.
- Only the Time Keeper may Broadcast Time, MT=0x3F,M1-1 or MT=0x38 on the system bus. Broadcast of Time will work in both token and non-token mode. Non-Token Enable is not needed.
- The internal operation of the controller is based on the software clock. The Time Keeper will read the hardware clock once an hour at a 11 minutes and 13 seconds after the hour, a time that does not conflict with any controller events. If the controller is not a TimeKeeper, the hardware clock is only read at power up as a back up.

ASIC/2-7040 FW740C Rev 1.8 12/17/97

Fixes problem with receipt and clearing of special day on communication line using MT=3Fh, M1=1. To receive special days on communication line CLK Special Day Enable must not be set in the controller.

ASIC/2-7040 FW740C Rev 1.4 07/11/97
ASIC/2-8040 FW840B Rev 1.4 11 July 1997

- Fixes problem with bad time broadcast on system bus.

ASIC/2-7040 FW740C Rev 1.0, March 1997

Add Active Special Day and Special Day Enable

ASIC/2-7040 FW740C Rev 1.4 Released 07/11/97

- Fixes problem with bad time broadcast on system bus.

ASIC/2-8040 FW840A Rev 1.4 Released 09 July 1997

- Fixes incorrectly formed time message by clock on System Bus

SINC/2-2000 FW200A Rev 1.9, Released January 1997

Fixes SINC/2 clock bug for 25 Dec to 31 December during leap years. This was not a problem for FW740.

ASIC/2-8040 FW840A Rev 1.0, March 1996.

ASIC/2-7040 FW740A Rev 1.1 27 May 94

- Clock Object - modified hardware clock read to update the software clock once per minute. Now seem robust. Should fix problems with Trend, Count, Demand that depend on minute flag.

ASIC/2-7040 FW740A Rev 1.0, Released 31 March 1994

Initial Release with Hardware Clock.

Note: this has a revised holiday schedule including month, date, and number of days and deletes predefined holidays.

SINC/2-2000 FW200A Rev 1.3, Released 1 Sept 1993

Initial Release with Hardware Clock.

Note: this has a revised holiday schedule including month, date, and number of days and deletes predefined holidays.

ASIC/2-7000 FW700G Rev 1.0

Fixed Bug for predefined Holidays: 4 July was interpreted as 7 April.25 December was interpreted as day 12 of month 25!

SC/1-9040 Rev. 1.0 FW907E, Released 3 Dec. 1992,

Reads Hardware Clock every 30 seconds. Daylight Savings Feature Fixed.

Clock DYNAMIC Properties

Attr-0 Clock Status

These internal flags are only set momentarily.

LO bit 0 - **1 Second Flag**
LO bit 1 - **1 Minute Flag**
LO bit 2 - **30 Second Flag**
LO bit 3 - **7.5 Minute Flag**
LO bit 4 - **1 Hour Flag**
LO bit 5 - **1 Day Flag**
LO bit 6 - **1 Week Flag**
LO bit 7 - **Holiday Flag**

HILSNBL - **Active Special Day** (FW740C...)

HI bit 4 - Reserved (Month Flag -Not Implemented)
HI bit 5 - Reserved (Year Flag -Not Implemented)
HI bit 6 - Reserved (C_INHIBIT_HOLIDAY_SCHED)
HI bit 7 - Reserved (Broadcast Time Now ,C_CAST_IT)

Attr-1 Current Time

LO BYTE - **Current Time - Second** (0..59)
HI BYTE - **Current Time - Minute** (0..59)

Attr-2 Current Time

LO BYTE - **Current Time - Hour** (0..24)
HI BYTE - **Day of Week** (1..7)
1 = Monday, ..., 7 = Sunday

Attr-3 Current Date

LO BYTE - **Current Date - Month** (0..24)
HI BYTE - **Current Date - Day of Month** (1..31)

Attr-4 Action

Implemented with (FW907C..,700A, 770A.., FW200A)

0 = No Action
1 = Update Holiday Schedule
2 = Set to 50 Hz
3 = Set to 60 Hz
4 = Read Hardware Clock Now (diagnostic)
5 = Override Active Special Day = 1 (FW740C..)
6 = Override Active Special Day = 2 (FW740C..)
7 = Override Active Special Day = 3 (FW740C..)
8 = Override Active Special Day = 4 (FW740C..)
9 = Override Active Special Day = 5 (FW740C..)
10 = Override Active Special Day = 6 (FW740C..)
11 = Override Active Special Day = 7 (FW740C..)
12 = Override Active Special Day = 0 (FW740C..)

Attr-5 Year, Timer

LO BYTE - **Current Date - Year** (90..99)
HI BYTE - **Broadcast Timer (minutes)**

Clock STATIC Properties

Attr-6 Clock Setup

LO bit 0 - **Time Keeper Enable**, 1 = Yes, 0 = No
If set the controller updates its software clock from its hardware clock upon reset or upon receipt of 3F, M1 = 1 Message. If no hardware clock, do not set this enable. (ASIC/2-7040 FW740C Rev 2.0 and ASIC/2-8040 FW840C Rev 1.0, SINC/3 and later)
Hardware Clock Enable, 1 = Yes, 0 = No
Enables Hardware Clock in earlier firmware versions ASIC/2, SC/1, SINC/2

LO bit 1 - **ASIC/2 Time Enable (0x3F)** ,
Allows the SC/1, ASIC/2, or SINC/2 to broadcast ASIC/2 Time on the system bus using the MT=0x3F, M1=1 message.

LO bit 2 – **ASIC/1 Time Enable (0x38)** (FW700A., FW740, FW754.)
Allows the ASIC/2 or SINC/2 to broadcast ASIC/1 Time on the system bus using the MT=0x38. (FW700A.. Only)

LO bit 3 - **Update Clock Enable** Not used by SINC/3, 740C2.0, 840C1.0 and later.

LO bit 4 - **Holiday Schedule Enable**,
1 = Yes, If enabled use my holiday schedule.
0 = No, Use Holiday from 3F broadcast.
Note: This should only be set in the master hardware clock. If set verify that the Holiday Schedule is correct.

LO bit 5 - **Reserved**

LO bit 6 - **Non-Token Bus Enable**, Not used by SINC/3, 740C2.0, 840C1.0 and later.

LO bit 7 - **Daylight Savings Time Enable**, 1 = Yes, 0 = No. Spare
If set it will set the clock forward 1 hour in the Spring, and set the clock back one hour in the Fall, based on an internal calculation of the proper date. This bit must be set and the controller must pass through the proper date and time for it to be in effect. See, Attr-6, HI bit 0 below.

HI bit 0 - **Daylight Savings Status**, 1 = Yes, 0 = No.
If controller enters daylight savings this bit will be set. It is a static data bit which is set and cleared once per year, so that the controller recovers from power outage in daylight saving time.

HI bit 1 - **50 Hz Enable**
1 = 50 Hz; 0 = 60 Hz. Identifies the line frequency used for keeping time.

HI bit 2 – **ASIC/1 Global Enable**
5A5Ah address for ASIC/1 Time MT=0x38h broadcast

HI bit 3 - **Special Days Enable** (FW740C..)
HI bit 4 - **DLS Date Enable** (FW7/854a1.5)
HI bit 5 - Spare
HI bit 6 - Spare
HI bit 7 - Spare

Attr-7 Setup

LO BYTE - **Broadcast Interval** (Min)
Period for broadcasting time in minutes

HI BYTE - **Time Zone**
Geographical Time zone (signed) based on Greenwich. -5, Eastern Standard Time; -6, Central Standard Time; -7, Mountain Standard Time; -8, Pacific Standard Time ; -10, Pacific Island Standard Time, etc.

Attr-8 **Broadcast Address**
Target address for the broadcast of time. Global Broadcast on system bus uses typically 23152 (0x5A70) .

Holiday Schedules

Attr-9 through Attr-28 Holidays
- LO BYTE = Holiday - Date (1..31)
- HI BYTE = Holiday - Month (1..12) FW907.., FW700A..
- HILSNBL = Holiday - Month (1..12) FW200A..,FW300A..
- HIMSNBL = Holiday - Number of Days(1..15) FW200A..,FW300A..

Attr-9 1st Holiday
Attr-10 2nd Holiday
Attr-11 3rd Holiday
Attr-12 4th Holiday
Attr-13 5th Holiday
Attr-14 6th Holiday
Attr-15 7th Holiday
Attr-16 8th Holiday
Attr-17 9th Holiday
Attr-18 10th Holiday
Attr-19 11th Holiday
Attr-20 12th Holiday
Attr-21 13th Holiday
Attr-22 14th Holiday
Attr-23 15th Holiday
Attr-24 16th Holiday
Attr-25 17th Holiday
Attr-26 18th Holiday
Attr-27 19th Holiday
Attr-28 20th Holiday

Custom Daylight Savings Dates

Attr-29 Start Date (FW7/854a1.5, FW300b3.0)
- LO_LSNBL **Start Month** - 0 = default, 1..12 [Jan .. Dec]
- LO_MSNBL **Start Week** - 0,1=First, 2=Second, 3=Third, 4=Fourth, 5=Last
- HI_LSNBL **Start Day of Week** - 0,1=Mon, ..7=Sun
- HI_MSNBL Spare

Attr-30 End Date (FW7/854a1.5, FW300b3.0)
- LO_LSNBL **End Month** - 0 = default, 1..12 [Jan .. Dec]
- LO_MSNBL **End Week** - 0,1=First, 2=Second, 3=Third, 4=Fourth, 5=Last
- HI_LSNBL **End Day of Week** - 0,1=Mon, ..7=Sun
- HI_MSNBL **DLS Adjustment** - 0,1 = 1 hour, 2 hours

Attr-31 Spare (FW7/854a1.5, FW300b3.0)

Attr-32 Spare (FW7/854a1.5, FW300b3.0)

Attr-33 Spare (FW7/854a1.5, FW300b3.0)

Object 13 - Poll List

Poll List Summary

Overview: Polling is the process of initiating requests for data from controllers on the local bus of the ASIC/2 or SINC/3 controller. The Poll Manager object is used to oversee the polling of ASIC/1 terminal unit controllers and ASIC/2 configurable controllers for their alarm status or other data. The Poll Managers work with the Poll List to gather information from controllers on the Local Bus. The address of each controller to be polled is kept in the Poll List. The poll managers hold the instructions for the poll list as to which information to collect and where to put the information. More than one poll manager may be used so that a variety of information may be obtained from the Local Bus controllers.

Device Address: Each index of the Poll List object is assigned controller Device Address with which it polls. The index is responsible for polling its controller with messages supplied by the active poll manager. It processes and stores the received data in memory according to the active poll manager's instructions. The data is then available for examination by the poll manager or by the user interface software. Different indexes may be assigned with the same Device Address in order to collect different information.

Poll Group (Authority): Each Poll List index is assigned a single Poll Group (Authority). Controllers with the same Poll Group (Authority) are supplied with the same polling instructions by the Active Poll Manager which has their Poll Group (Authority). Each poll manager may have up to 4 Poll Groups (Authorities). Each group of controllers requiring the same data to be collected and summarized will have the same Poll Group (Authority).

Status Polling: Typically, all Poll List indexes are polled for alarm data. The Poll List has status parameters to indicate Low and High Zone Temperature Alarms, Low and High Primary Airflow Alarms, or other alarms, the control mode, the control state, and the afterhours request status for the controller. The meaning of each alarm depends on the specific ASIC/1 product.

Data Polling: There are 8 dynamic Poll Data Bytes defined in the Poll List for storing this data. The Poll_8x55 Poll Instruction also brings up 8 bytes of data from ASIC/1 Table 16. It also is possible to poll for specific data, for example the Zone Temperature by setting up a Poll Manager using the Place Data instruction.

Message Pass-Through- System Bus to Local Bus: Messages received on the system bus will be passed through to the local bus:

1) if the destination address of the message is the assigned address for any index of the Poll List whether enabled or not.
2) A destination address of 5A5A (the global address) or

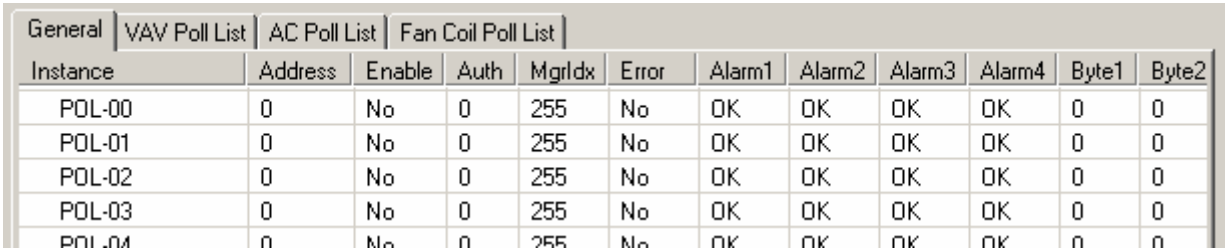
3) if the address is between the Lowest and Highest Pass-through Address

The polled controller may issue a response message; which are passed back as long either the source or destination address contained in the Poll List. Messages may only be initiated on the system side.

Local Bus Assignment: The SINC/3 allows assigning the Polling to Local 1, or Local 2.

Poll List Sequence

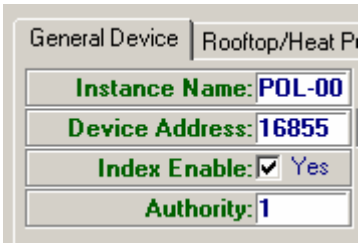
The Poll List Object is Data Type BYTE; It is used to keep the list of addresses for Zone Polling, and for pass through of messages from the system bus to the local bus. The POLL LIST object must be allocated and enabled for pass through to occur.



Instance	Address	Enable	Auth	MgrIdx	Error	Alarm1	Alarm2	Alarm3	Alarm4	Byte1	Byte2
POL-00	0	No	0	255	No	OK	OK	OK	OK	0	0
POL-01	0	No	0	255	No	OK	OK	OK	OK	0	0
POL-02	0	No	0	255	No	OK	OK	OK	OK	0	0
POL-03	0	No	0	255	No	OK	OK	OK	OK	0	0
POL-04	0	No	0	255	No	OK	OK	OK	OK	0	0

Device Address

Each index of the Poll List has an Index Enable flag, a Device Address, and a Poll Group (Authority). If the Index Enable is set to No, then the Poll List entry is ignored for polling purposes.



Each index of the Poll List object is assigned controller Device Address with which it conducts polls. Different indexes may be assigned with the same device address in order to collect different information.

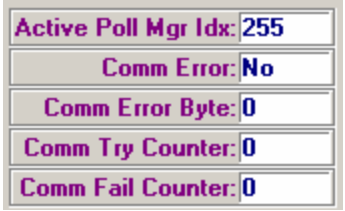
Each Poll List index is assigned a single Poll Group (Authority). Controllers with the same Poll Group (Authority) are all supplied with the same polling instructions by the Active Poll Manager index for that Poll Group (Authority). The same Poll Group (Authority) is used for each group of controllers for which the same data is to be collected.

Each poll manager may have up to 4 Poll Authorities.

Dynamic Data

Active Poll Manager Index

The Active Poll Manager Index identifies the manager responsible for polling its controller with messages on the next polling round. During the polling round, the Active Poll Manager generates the polling request and processes the received data according to the it's Poll Instruction.



Communication Error

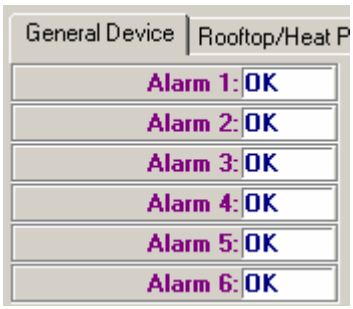
During the polling round each controller is asked once for it's data. If the request fails it registers a communications error.The Comm Try Counter tracks the number of successive unsuccessful polling attempts which have been made. When the m Try Counter becomes equal to 4, Communications Error flag is set to "Yes", and The Comm Fail Counter is incremented. The Comm Error status is reset upon re-establishing communications. The poll list will continue to attempt to poll the controller unless the index is disabled.

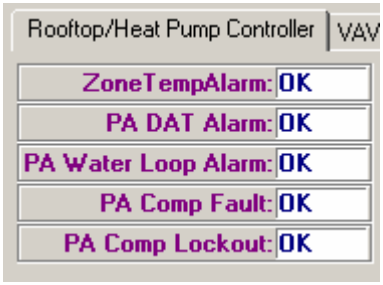
The counters are reset automatically once an hour, on Reset of Power, and.via the Poll List Action.

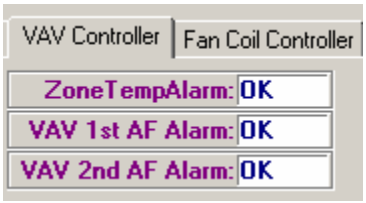
Pre-defined Alarm and Status Data

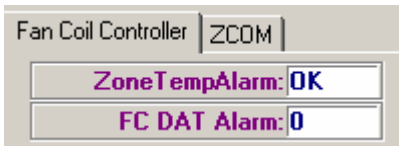
The Poll List has three bytes of alarm and status data that may be collected by a properly configured Poll Manager. This data is available for a Poll Manager to calculate summary information or for monitoring by a user interface.

Alarm Data









Attr-0 Bit 0 Alarm 1 HI Zone Temperature
Attr-0 Bit 1 Alarm 1 LO Zone Temperature
Attr-0 Bit 2 Alarm 2 HI
Attr-0 Bit 3 Alarm 2 LO
Attr-0 Bit 4 Alarm 3 HI
Attr-0 Bit 5 Alarm 3 LO
Attr-0 Bit 6 Alarm 4 HI
Attr-0 Bit 7 Alarm 4 LO
Attr-1 Bit 0 Alarm 5 HI
Attr-1 Bit 1 Alarm 5 LO
Attr-1 Bit 2 Alarm 6 HI
Attr-1 Bit 3 Alarm 6 LO
Attr-1 Bit 4 Alarm 7 HI
Attr-1 Bit 5 Alarm 7 LO
Attr-1 Bit 6 Alarm 8 HI (ASIC/2 Only)
Attr-1 Bit 7 Alarm 8 LO (ASIC/2 Only)

Status Data

Attr-2 Bits 0,1 Control Mode
Attr-2 Bits 2,3 Control State
Attr-2 Bit 4 Acknowledge
Attr-2 Bit 5 Communication Error
Attr-2 Bit 6 In Afterhours
Attr-2 Bit 7 Heat pump Request

Polled Data

The Poll List has 8 dynamic Poll Data Bytes for storing data. A Poll Manager can be configured to request specific data from a controller. The Poll_8x55 Poll Instruction also brings up 8 bytes of data from ASIC/1 Table 16. It also is possible to poll for specific data using the Place Data instruction, for example the Zone Temperature by setting up a Poll Manager. Place Data is used to relocate the response data to one or more sequential Poll Data Bytes. See Poll Manager Definition for further details.

Note: Care must be taken that different Poll Managers do not over-write the same Poll Data Bytes.

Poll List Glossary

Poll List Parameters

Active Poll Manager Index

Indicates which index of the Poll Manager is currently active. The active Poll Manager controls the poll request message and the storage of the response data. Not user-changeable; integer. POL_ActivePollMgrIdx (13,X,3,BYTE)

Alarm n High

Used to record the presence of various High Alarms in the polled controller. "n" is from 1 through 8. The polling instruction for a given Poll Group is chosen when configuring indexes of the Poll Manager. The meaning of each alarm depends on the ASI Control product. "Yes", "No"; not user-changeable. (13, X, 0..1, bit_n)

Alarm n Low

Used to record the presence of various LO Alarms in the polled controller. "n" is from 1 through 8. The polling instruction for agiven Poll Group is chosen when configuring indexes of the Poll Manager. The meaning of each alarm depends on the ASI Control product. (13, X, 0..1, bit_n)

Comm Fail Counter

If the Comm Try Counter passes 4 , then Comm Error Status is set, the Comm Fail Counter is incremented, and the Comm Try Counter is cleared. POL_CommFailCounter (13,X,Attr-5 MSNBL) FW740C Rev 2.0, FW840C Rev 1.0

Comm Try Counter

The Comm Try Counter is incremented when ever there is an unsuccessful communication. The Comm Try Counter is cleared whenever there is a successful communication. POL_CommTryCounter (13,X,Attr-5, LSNBL) FW740C Rev 2.0, FW840C Rev 1.0

Communications Error Byte

Comm Try Conter LSNBL and Comm Fail Counter HSNBL
FW740C Rev 2.0, FW840C Rev 1.0, and later
The Comm Error Byte tracks the number of successive unsuccessful polling attempts which have been made POL_CommErrorCounter (13,X,5,BYTE) Up to FW740C 1.9

Communications Error Status

Indicates 4 successive unsuccessful attempts at polling a device. Reset by re-establishing communication. "Yes", "No";. (13,X,2,BIT 5)

Device Address

Device address used for polling and pass-thru. May also be a Group or Global Address.
POL_DeviceAddress (13,X,16,2_BYTES)
Low byte of the device address. (13,X,16,BYTE)
High byte of the device address. (13,X,17,BYTE)

Heat Pump Request to Operate

Indicates that a polled Heat Pump controller has requested operation. "Yes", "No"; not user-changeable. POL_HPRequestOperate (13,X,2,BIT 7)

In Afterhours

Indicates that a polled ASIC/1 controller has requested afterhours operation. "Yes", "No"; not user-changeable. POL_InAfterhours (13,X,2,BIT 6)

Index Enable

Enables this index of the Poll List for participation in the polling process. If a given Poll List index is not enabled, then the Poll Manager will bypass it when conducting the polling process or when summarizing data. "Yes", "No"; user-configurable. POL_IndexEnable (13,X,14,BIT 0)

Local Bus Assignment

The SINC/3 allows assigning the Polling to Local 1, or Local 2. (13,X,14,Bits23) FW300B.

Control Mode

If a controller was polled by the Poll Manager for its Controller mode, then the result is stored here. "Cooling", "Heating", "Deadband"; not user-changeable. POL_ControlMode (13,X,2,BIT 0,1)

Poll Group (Authority)

Designates which poll group to which this Poll List index belongs Each Poll List index is assigned a single poll Poll Group (Authority). Each group of controllers requiring the same data to be collected and summarized have the same Poll Group (Authority). Each poll manager may have up to 4 Poll Authorities. POL_Authority (13,X,15,BYTE)

Poll List Action

Setting this parameter equal to the listed values causes the corresponding action to occur:

0	No effect
1	Set Index Enable to "No"
2	Set Index Enable to "Yes"
3	Reset Communications Error Counter to "0"

POL_Action (13,X,4,BYTE)

Polling Data Byte X

Polled data is stored here by the Poll Manager using Manager Function 15, Place_Data; or 12, Poll_8x55 Not user-changeable. POL_DataByte1,…, POL_DataByte8 (13,X,6..13,BYTE)

Control State

If a controller was polled by the Poll Manager for its Controller State, then the result is stored here. "Unoccupied", "Occupied", "Night Setback", "Morning Ready"; not user-changeable. POL_ControlState (13,X,2,BIT 2,3)

Poll List Properties

The Poll List Object is Data Type BYTE; It is used to keep the list of addresses for Zone Polling, and for pass through of messages from the system bus to the local bus. The POLL LIST object must be allocated and enabled for pass through to occur.

Any message addressed to Terminal Unit Global. (5A 5Ah) is passed through.

To pass through messages to group addresses (NN 00h), the group address must be included in the polling list. Polling of group addresses always results in a communication error.

POLL LIST Object Number	POL, 13
Data Type	Byte
Index	0..n as allocated
Attributes	18 (0..17)
DYNAMIC Attributes	14 (0..13)
STATIC Attributes	4 (14..17)

Poll List Firmware Revision

ASIC/2-7540 FW754A Rev 1.0 Forthcoming 2005

- As in FW740E.

ASIC/2-7040 FW740E Rev 2.7h Released 2005-01-14 CHK 0xD2F6 PN70002-16
ASIC/2-8040 FW840E Rev 2.7h Released 2005-01-18 CHK 0xAE98 PN70006-13

- Fixes MT=0x27, 0x28 pass-through to Local bus
- Fixed problem with the poll manager clearing the poll list COM Error(bit 5).

SINC/3-3000 FW300B Rev 2.8g Released 2002-12-24 CHK 0xADC2 PN 70015-03

- Fixes Pass-through of MT=0x27, Override Analog Output Value, and MT=0x28, Clear Analog Output Override

SINC/3-3000 FW300B Rev 1.3 Released 2000-03-15 CHK 0x625E

- Fixes Poll List Actions Attr-4
  3= Clear Error Counter, 4 = Assign Local 1, 5= Assign Local 2.
- Fixes Poll Manager Function which does not depend on Local Bus Assignment
- Poll Instruction depends on Local Bus Assignment
- Improves polling speed on local busses.
- Polling Pause now 1 to 4 seconds after each scan.

ASIC/3-3000 FW300B Rev 1.0 Released 1999-10-16

Adds Local Bus Assignment

ASIC/2-7040 FW740C Rev 2.0 Released 1998-06-05
ASIC/2-8040 FW840C Rev 1.0 Release 1998-06-05

- Improved Local Bus Polling. Added protection for corrupt messages because of other traffic on the line.
- Changed Poll List Communications Error Counter
  Attr-5 LSNBL Comm Try Counter
  Attr-5 MSNBL Comm Fail Counter

  The Comm Try Counter is incremented when ever there is an unsuccessful communication. The Comm Try Counter is cleared whenever there is an successful communication. If the Comm Try Counter reaches 5, then Attr-2 bit 5 Comm Error Status is set the Comm Fail Counter is incremented, and the Comm Try Counter is cleared. The Comm Error Status is cleared whenever there is a successful communication.

ASIC/2-7040 FW740C Rev 1.9 Released 1998-04-15

- Polling on the local bus is speeded up by only trying once for each address. The polling process retries once each polling round.
- The communication error counter for all indexes can now be cleared using Poll List Action. Attr-4, Action : 1 = ENABLE INDEX; 2 = DISABLE INDEX; 3 = CLEAR THIS INDEX ERROR

ASIC/2-7040 FW740D Rev 1.3 Released 10/02/96
ASIC/2-7040 FW740A Rev 2.2 Preliminary 10/03/96

- Fixes Problem related to polling ASIC/1-8055 controllers following pass through of a global message. This version should be used by anyone polling ASIC/1-8055, -8255, or -8355 controllers.

ASIC/2-7040 FW740A/B Rev 1.8 Released 12 April 95
Significantly improved polling robustness and pass through reliability.
Pass through uses a gap to allow multiple messages to be passed through.
Error count is greatly reduced.

ASIC/2-7040 FW740b Rev 1.6 Released 2 Dec 1994
Pass through has been improved. When a table message 7E requested more than 32 bytes of data the controller would continue to pass the last message through and not pass the response back.

ASIC/2-7040 FW740A Rev 1.4 Release 7 Sept 94
- Fixed Local Bus Lockup Bug
- Improved Polling on Local Bus

ASIC/2-7040 FW740A Rev 1.1 27 May 94
Object 13 Poll List now properly polls all indexes on each round.
There is still a slight problem with pass through of long messages from an ASIC/1-8015 to SETVAV.

SC/1-9040 Revision: PROT12 9XXA 02/06/91

Poll List DYNAMIC Properties

Attr-0 Alarm Status 1
- bit 0 - **Alarm 1 Hi**
- bit 1 - **Alarm 1 Lo**
- bit 2 - **Alarm 2 Hi**
- bit 3 - **Alarm 2 Lo**
- bit 4 - **Alarm 3 Hi**
- bit 5 - **Alarm 3 Lo**
- bit 6 - **Alarm 4 Hi**
- bit 7 - **Alarm 4 Lo**

Attr-1 Alarm Status 2
- bit 0 - **Alarm 5 Hi**
- bit 1 - **Alarm 5 Lo**
- bit 2 - **Alarm 6 Hi**
- bit 3 - **Alarm 6 Lo**
- bit 4 - **Alarm 7 Hi**
- bit 5 - **Alarm 7 Lo**
- bit 6 - **Alarm 8 Hi** (ASIC/2 Only)
- bit 7 - **Alarm 8 Lo** (ASIC/2 Only)

Attr-2 Polling Status
- bit 0,1 - **Mode** 0 = DB, 1= CLG, 2 = HTG
- bit 2,3 - **State** 0 = UNOCC, 1 = OCC, 2 = NSB, 3 = MRDY
- bit 4 - **Acknowledged**
- bit 5 - **Communication Error Status**
- bit 6 - **In After-hours**
- bit 7 - **Heat Pump Request** (Heat Pump's Only)

Attr-3 **Active Poll Manager Index**

Attr-4 Action

Poll Index Enable Action
- 1 = Enable Index
- 2 = Disable Index
- 3 = Clear Communication Error Counter

Attr-5 Communication Error Byte
- MSNBL – **Comm Fail Counter**
- LSNBL – **Comm Try Counter**

FW740C Rev 2.0, FW840C Rev 1.0

Poll Data Bytes

Attr-6 **Poll Data Byte 1**
Attr-7 **Poll Data Byte 2**
Attr-8 **Poll Data Byte 3**
Attr-9 **Poll Data Byte 4**
Attr-10 **Poll Data Byte 5**
Attr-11 **Poll Data Byte 6**
Attr-12 **Poll Data Byte 7**
Attr-13 **Poll Data Byte 8**

Poll List STATIC Properties

Attr-14 Setup 1 (P_SETUP_1)
Bit 0 - **Index Enable**, 1 = Yes, 0 = No
Bit 1 - Spare
Bits23 - **Local Bus Assignment -(** FW300B..)
assigns Polling to Local 1, or Local 2. 0 or 1 = Local 1, 2 = Local 2

Attr-15 **Poll Group (Authority)**
Used by the polling manager to select different controllers for different activities.

Attr-16 **Device Address** LO Byte

Attr-17 **Device Address** HI Byte

Object 14 - Alarm

Alarm Summary

Note: More comprehensive Alarm and Event Notification is available in Object 37, Notify, available in FW740E, 840E and 300B, and ASIC/2-7540.
The Object 14, Alarm, is maintained for backward compatibility with earlier products.

ALR-00
Alarms

Overview: The alarm object maintains an up-to-date list of those alarms present in other controller objects that have been configured to be included here.

Alarm Identification: Each index of the alarm object contains a data which indicates the object, index, attributes, and bits to be looked at for the status of the alarms it tracks. This is not a usual handle. All alarms for a given index must come from the same object and index. For example, inputs can go into alarm on the basis of their readings (High/Low alarms) and also on the basis of the sensor physically failing (Fault alarm).

Types of Alarms: Each index of the alarm object is capable of recording the status of any or all of a number of types of alarms. Typically, all the alarms refer to some common feature or sensor (e.g. a water loop temperature sensor). The different types of alarms are as follows: High Alarm, Low Alarm, Fault Alarm, and Change of State Alarm.

High Alarm: A high alarm indicates that a sensor reading has gone above a user-set high alarm setpoint. High alarms and low alarms do not exist simultaneously.

Low Alarm: A low alarm indicates that a sensor reading has gone below a user-set low alarm setpoint. High alarms and low alarms do not exist simultaneously.

Fault Alarm: Fault alarms indicate that the sensor or attached equipment is not responding in the way in which it should. Exactly what the fault refers to is not recorded in the alarm object. The object in which the alarm originates must be examined for this information. The fault alarm could be due to a bad sensor, a failure to verify output, or a time-out alarm.

Change of State Alarm: Any bit of any object in the controller may be looked and an alarm based on its status. If the bit changes state, an alarm is set.

Priority: Each index of the alarm object may be assigned to be of no, low, middle, or high priority. The highest level of priority for unacknowledged alarms is also recorded in the System Object 1.

Alarm Acknowledge: Any index of the alarm object may be marked as acknowledged by the user through a building management system. Acknowledging an alarm does not clear the alarm.

Alarm Event: Any index of the alarm object may be included in the list of alarms monitored by an Event Manager index. If the Alarm Event Enable is set, then when any of the alarms change, the Alarm Event Flag is set. The properly configured event manager logs the occurrence of the alarm, and clears the Alarm Event Flag. Recording an alarm event does not clear the alarm.

Clearing of Alarms: Some alarms clear automatically once the conditions which caused them to occur disappear. Other alarms must be directly cleared by the user through operator intervention. No alarms may be cleared through the alarm object. They all must be cleared through the object in which they originated.

Alarm Time Stamp: The elapsed time when the alarm first appeared is recorded in 7.5 minute increments.

Lockout of Alarms: Any index of the alarm object may be prevented from recording any of its alarms based on the status of any alarm in another index of the alarm object. The alarm may be locked-out on the basis of the other alarm being present, or on the basis of the other alarm not being present. The lock-out may also be based on the whether the lock-out in another index is in effect. The lock-out is enforced for a user-defined delay and then removed. The purpose of this feature is to prevent unwanted alarms from appearing due to timing considerations (e.g. upon turning on an air handling unit, the static pressure will generally not stabilize for a few minutes; during this time, high and low static pressure alarms are undesirable). Optionally, the lockout may be permanently enforced (e.g. is a boiler is disabled, one would not want to see a low alarm for the water loop temperature).

Alarm Label: Beginning with FW700i, each index of the alarm object has a 16-character label which is stored in EEPROM.

Alarm Operation

Alarm Status

The alarm status is ALWAYS the bit is SET (1). The alarm clear is the bit not set (0). The alarm object simply collects and echoes the status of various alarm and status bits from status words in other objects. Each alarm must be enabled and the Target Bits Identified.

Alarm Monitoring

Each attribute of the alarm object is a single Byte. The status of up to 64 alarms, index 0..63, could be returned to a host system in a single message. The status (System,0,Attr-0, Lo Bit 4) and priority (System,0,Attr-0, Lo Bits 5,6)of the highest priority of unacknowledged alarm is available in the System object. Thus any configurable controller can be polled for the existence of unacknowledged alarms, and if found the alarm status may be updated.

Alarm Acknowledgment

A specific alarm is acknowledged by writing a 1 to the Alarm Action with the index of the alarm being acknowledged. Writing a 5 to Alarm Action of any index will ACKNOWLEDGE ALL alarms (0..63) that are in effect.

The acknowledgment is cleared by the system controller, whenever any of the alarm bits (0..4) change state; i.e. a new alarm appears, or an existing alarm goes away.

Each possible Alarm bit is separately enabled. Therefore attribute 0, or bit 0 is a good assignment. Typically if it is not assigned the value is 0. The following examples illustrate the use of alarms.

NOTE: Alarms are defaulted to priority = 0 (Attr-6 Enable bits 5,6 = 0) with no locks (Attr-6 Enable bit 4 = 0)

Clearing Alarms

Some alarms go away on their own when the alarm conditions clear. Others require operator intervention. Some Alarms must be cleared over communications. The alarms must be cleared in the object where they originate.

For example: The PID Verify Alarm must be cleared. The PID Object has an PID Action = 3 to specifically clear this alarm. The Verify Alarm must be cleared from the PID screen. The Alarm screen only reports the presence of the alarm.

Alarm Event

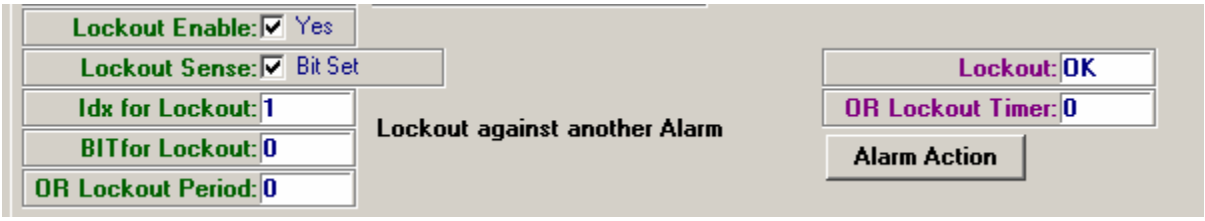
The ASIC/2 Event Manager has the ability to monitor any index of the alarm object and to log the occurrence of an alarm in the Event List. If the Alarm Event Enable is Yes, then when any of the alarms change, the Alarm Event Flag is set. The properly configured event manager logs the occurrence of the alarm, and clears the Alarm Event Flag. Posting an alarm event does not clear the alarm.

Alarm Polling

The Poll Manager object in the ASIC/2-7040 has the ability to request the alarm status Low, High, Fault, and COS of 4 indices of the alarm object in an ASIC/2 controller. This allows limited polling of configurable controllers for alarm status of ASIC/2 controllers.

Alarm Lockout

An alarm can be disabled by the presence of another Alarm. Lockout Enable is Yes, and the Index for Lockout , 0..63, (Attr-7, bits 2..7) is specified The Bit for Lockout (Attr-7 Lockout, bits 0.1 is also specified: 0 = LOCK on another index lock bit; 1 = Low Alarm; 2 = High Alarm; and 3 = Fault Alarm The Lockout Sense may also be specified (Attr 6, bit 7): 1 = Lockout when Bit set, 0 = Lock-out when Bit not set.



The alarm's Lockout Status is set to Yes when the lockout condition for the alarm is satisfied. .

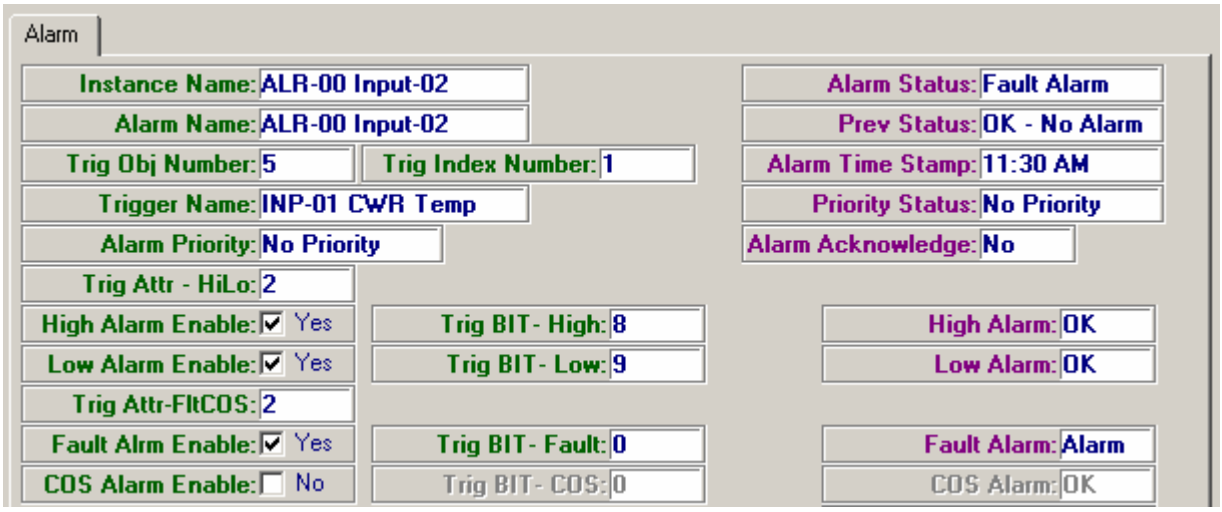
Override Lockout Feature

If the Override Lockout Period in minutes is Non Zero, then the lockout is enforced until the Override Lockout Timer times out. After the Override Lockout Timer times out, the alarm is set.

If the Override Lockout Period is Zero, the lockout is always enforced.

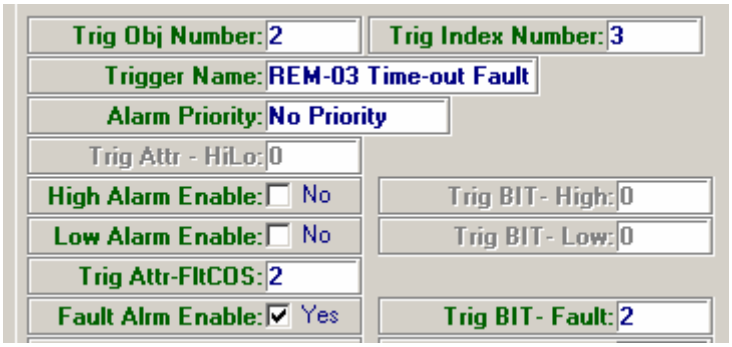
Alarm Configuration

Input Alarms



Trigger Object Number = 05, Input
Trigger Index Number = 1
Low Alarm Enable = Yes, INPUT, Attr-2 Status, HI bit 0 (bit8)
High Alarm Enable = Yes, INPUT, Attr-2 Status, HI bit 1 (bit 9)
Fault Alarm Enable = Yes, INPUT, Attr-2 Status, LO bit 0
COS Alarm Enable = No, Not Defined

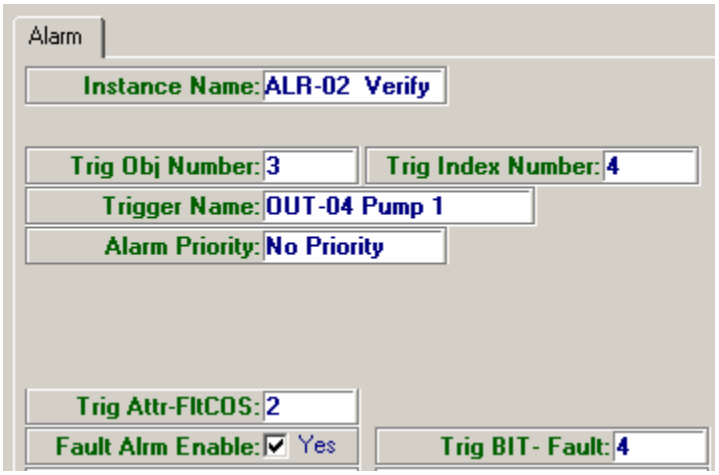
Remote Point Fault Alarm



Trigger Object Number = 02, Remote
Trigger Index Number = 3, as assigned.
Low Alarm Enable = No, Not Defined
High Alarm Enable = No, Not Defined
Fault Alarm Enable = Yes, REMOTE Attr-2 Status, LO bit 2, Time-out Fault
COS Alarm Enable = No, Not Defined

Output Alarms

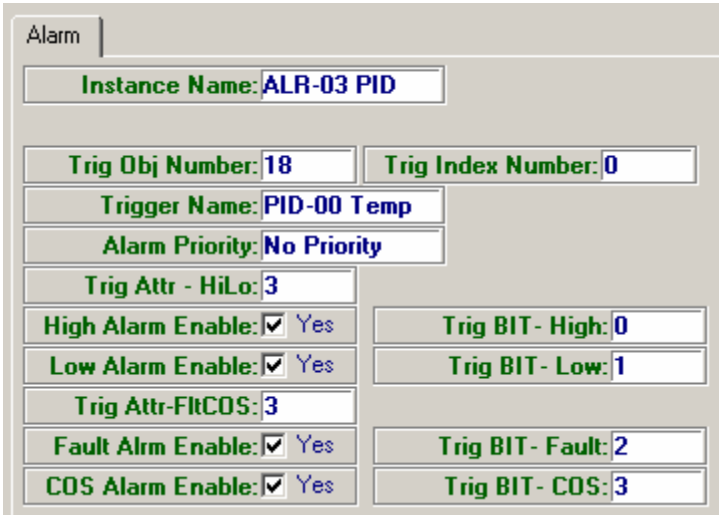
The output object has a single Verify Alarm which is set if the output fails to start after Verify Maximum Tries.



Trigger Object Number = 03, OUTPUT
Trigger Index Number = 4, as assigned.
Fault Alarm Enable = Yes,OUTPUT Attr-2 Status, LO bit 4, Verify Alarm

PID Alarms

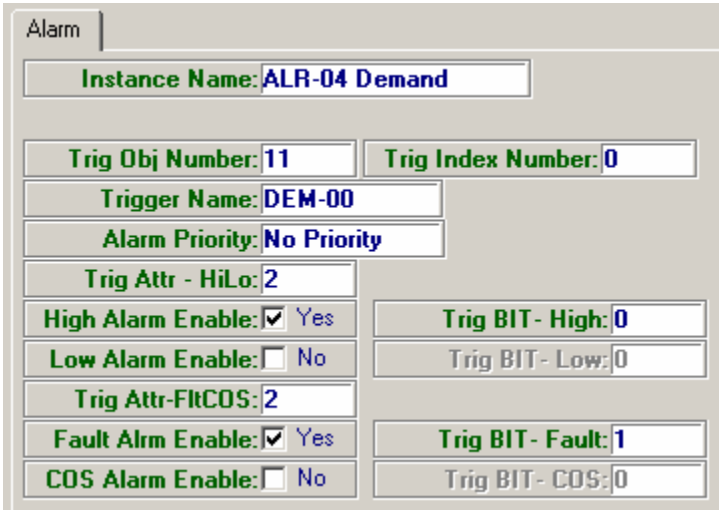
The PID object has High and Low Control Alarms(high/low) which is set if the control variable goes outside the Control SP range, a Verify Alarm(fault) which is set if the output fails to start after Verify Maximum Tries, and a Drive OK Alarm which is set if the Drive OK interlock fails.(COS).



Trigger Object Number = 18, PID
Trigger Index Number = 0, as assigned.
Low Alarm Enable = Yes, PID Attr-3, LO bit 0, Low Alarm
High Alarm Enable = Yes, PID Attr-3, LO bit 1, High Alarm
Fault Alarm Enable = Yes, PID Attr-3, LO bit 2, Verify Alarm
COS Alarm Enable = Yes, PID Attr-3, LO bit 3, Drive OK Alarm

Demand Manager Alarms

The demand manager object has a Demand Limit Alarm which is set if the kW Demand exceeds a Demand Limit SP(high), and a Demand Level Alarm (fault) which is set if the Demand Level Exceeds a certain level.



Trigger Object Number = 11, DEMAND
Trigger Index Number = 0, typical
Low Alarm Enable = No, Not Defined
High Alarm Enable = Yes, DEMAND, Attr-2 LO bit 0, Demand Limit Alarm
Fault Alarm Enable = Yes, DEMAND, Attr-2 LO bit 1, Demand Level Alarm
COS Alarm Enable = No, Not Defined

Alarm Glossary

Alarm Parameters

Alarm Acknowledge

Indicates that the index's Present Alarm has been acknowledged by the user via a interfacing building management system. Not user-changeable; "Yes", "No". (14,X,0,BIT 6)

Alarm Action

Writing the listed values to this parameter (14,X,4,BYTE) causes the corresponding action to occur:

0	No Action
1	Acknowledge This Alarm & Clear COS Alarm
2	No Action
3	No Action
4	Clear all RAM Attributes this index
5	Acknowledge All Present Alarms & Clear All COS Alarms
6	Clear Alarm Event Flag (FW700i)

Alarm Event Enable

Enables the setting of the Alarm Event Flag on change of HI, LO, FAULT, or COS alarm. "Yes", "No"; user-configurable. (14,X,8,BIT 0) (FW700i)

Alarm Event Flag

If Alarm Event Enable is set then the Alarm Event Flag is set on any change of HI, LO, FAULT, or COS alarm. "Yes", "No"; Not user-configurable. It is cleared by Action 6, Clear Alarm Event Flag (14,X,2,BIT 1) (FW700i)

Alarm Name

Each index of the alarm object has a 16 character label. (14,X,16..32, STRING) (FW700i, 7040, 8040, 7540)

Alarm Priority

Indicates the priority level to be used for any alarms currently in effect. The priority level is used in building management system to aid the user in responding to alarms. Not user-changeable; integer. (14,X,0,BIT 5)

Alarm Priority Configuration

Configures the priority level to be assigned to any Present Alarm(s). Priority levels are used in or other building management system to assist the operator in answering alarms. User-configurable; "Lowest", "Middle", "Highest". (14,X,6,BITS 5,6)

Alarm Time Stamp

If alarms were recorded during the most recent poll for alarms, this time-stamp indicates the time at which the poll was taken. However, only 1/8 hour increments may be registered, so the exact time the alarm occurred is unknown. Not user-changeable; hours:minutes. (14,X,3,BYTE)

Bit for Lockout

Designates which alarm in the Index for Lockout to examine to trigger lock-outs of this index's alarm(s). Lock-outs of this index's alarm(s) may also be triggered based on the status of Present Alarm Locked Out in the designated index. "Low Alarm", "High Alarm", "Fault Alarm" or "Lockout"; user-configurable. (14,X,7,BIT 0,1)

Change-of-State Alarm

Indicates if a Change-of -State Alarm was found during the most recent poll for alarms. The parameter pointed to by Trigger Attribute - COS and Trigger Bit - COS is looked at in setting the Change-of-State Alarm. Not user-changeable; "Alarm", "OK". (14,X,0,BIT 3)

Change of State Alarm Enable

Enables this index's Change of State Alarm for operation. "Yes", "No"; user-configurable. (14,X,6,BIT 3)

Fault Alarm

Indicates if a Fault Alarm was found during the most recent poll for alarms. The parameter pointed to by Trigger Attribute - Fault and Trigger Bit - Fault is looked at in setting the Fault Alarm. Not user-changeable; "Alarm", "OK". (14,X,0,BIT 2)

Fault Alarm Enable

Enables the index's Fault Alarm for operation. "Yes", "No"; user-configurable. (14,X,6,BIT 2)

High Alarm

Indicates if a High Alarm was found during the most recent poll for alarms. The parameter pointed to by Trigger Attribute - High Alarm and Trigger Bit - High Alarm is used in setting the High Alarm. Not user-changeable; "Alarm", "OK". (14,X,0,BIT 1)

High Alarm Enable

Enables the index's High Alarm for operation. "Yes", "No"; user-configurable. (14,X,6,BIT 1)

Index for Lockout

Designates which Alarm index to use when determining lock-outs for this index's alarm(s). Integer; user-configurable. (14,X,7,BITS 2..7)

Last State of COS

Indicates the last value read for the Change-of-State Target bit (designated by Trigger Attribute - COS and Trigger Bit - COS). User-configurable; "High", "Low". (14,X,2,BIT 0)

Lockout Enable

Enables lock-outs of the index's alarm(s). Lock-outs are based on the status of a designated alarm (Alarm to Lock Against) in another Alarm index (Index to Lock Against). "Yes", "No"; user-configurable. (14,X,6,BIT 4)

Lockout Sense

Designates whether this index's alarm(s) are to be locked-out on the basis of Alarm to Lock Against being in alarm, or on the basis of Alarm to Lock Against not being in alarm. "Alarm", "OK"; user-configurable. (14,X,6,BIT 7)

Lockout Status

Indicates if the lock-out feature is in effect for all existing Present Alarm(s). Lock-outs may occur due to user-overrides, or may be based on the status of another Alarm index's alarms. "Yes", "No"; not user-changeable. (14,X,1,BIT 4)

Low Alarm

Indicates if a Low Alarm was found during the most recent poll for alarms. The parameter pointed to by Trigger Attribute - Low Alarm and Trigger Bit - Low Alarm is used in setting the Low Alarm. Not user-changeable; "Alarm", "OK". (14,X,0,BIT 0)

Low Alarm Enable

Enables the index's Low Alarm for operation. "Yes", "No"; user-configurable. (14,X,6,BIT 0)

Override Lockout Period

Designates the time period which a user-sent Override Lockout is to remain in effect. User-configurable; in minutes. (14,X,9,BITS 4..7)

Override Lockout Timer

Used to time the Override Lockout Period. User-configurable; in minutes. (14,X,5,BYTE)

Previous Alarm Status

Previous value of Alarm Status. Not user-changeable; "Yes", "No".(14,X,1,BYTE)

Trigger Attribute - Fault/Change of State

Designates which attribute of Trigger Object, Trigger Index upon which to base this index's Fault Alarm and its Change of State Alarm. The Object Databases contain keys which list attribute numbers and their corresponding attribute names. Integer; user-configurable. (14,X,13,HIGH NIBBLE)

Trigger Attribute - High/Low Alarm

Designates which attribute of Trigger Object, Trigger Index upon which to base this index's High Alarm and its Low Alarm. The Object Databases contain information on the corresponding identification numbers for each attribute. Integer; user-configurable. (14,X,11,BYTE)

Trigger Bit - COS Alarm

Designates which bit of Trigger Attribute - COS Alarm upon which to base this index's Fault Alarm. User-configurable; integer 0 -> 7. (14,X,14,HIGH NIBBLE)

Trigger Bit - Fault Alarm

Designates which bit of Trigger Attribute - Fault Alarm upon which to base this index's Fault Alarm. User-configurable; integer 0 -> 7. (14,X,14,LOW NIBBLE)

Trigger Bit - High Alarm

Designates which bit of Trigger Attribute - High/Low Alarm upon which to base this index's High Alarm. User-configurable; integer 0 -> 7. (14,X,12,LOW NIBBLE)

Trigger Bit - Low Alarm

Designates which bit of Trigger Attribute - High/Low Alarm upon which to base this index's Low Alarm. User-configurable; integer 0 -> 7. (14,X,12,HIGH NIBBLE)

Trigger Index Number

Designates which index to use in configuring this Alarm index's alarm(s). Integer; user-configurable. (14,X,10,Byte)

Trigger Object Number

Designates which index to use in triggering this Alarm index's alarm(s). Integer 0..63; user-configurable. (14,X,9,Byte)

Alarm Properties

An ALARM object is defined which contains the setup information to define the user alarms. The alarms can be configured for Input and Output Alarms as well as User Alarms which point to alarm bits of other objects.

Object Name	ALARM
Object Number	= 14
Data Type	= Byte
Index	=n, as allocated
Attributes	= 16 (0..15) (32) FW700i..
DYNAMIC Attributes	= 6 (0..5)
STATIC Attributes	= 10 (6..15) (6..31) FW700i..

Alarm Firmware Revision

ASIC/2-8540 FW854a Ver 1.7r Release 2006-09-05 ECO-405 70027-03
ASIC/2-7540 FW754a Ver 1.7r Release 2006-09-05

o Fixes minor Bug in Alarm object.
Always used ALR Attr-11 Trigger Attribute - Hi/Lo Alarm
rather than ALR Attr-13 Trigger Attribute - COS/Fault for COS/Fault.

ASIC/2-7540 FW754A Rev 1.0 Forthcoming 2005

o As in FW740E.

SINC/3-3000 FW300B Rev 1.0 Released 10/06/1999

ASIC/2-8040 FW840A Rev 1.0, March 1996

ASIC/2-7040 FW740A Rev 1.2 14 June 94
Alarm Object - COS Alarm Enable now longer freezes other alarms.

ASIC/2-7040 FW740A.. Rev 1.0 Released 03/31/94
As in FW700i

ASIC/2-7000 Ver 1.0 FW700i Released 06/10/93
Add Alarm Event Flag
Add Alarm Event Enable, and
Add Clear Alarm Event Flag Action
Add Alarm Label

ASIC/2-7000 FW700A.. Rev 1.0 Released 12/05/91
SC/1-9040 FW907A Rev 1.0 Released 07/25/91

Alarm DYNAMIC Properties

Attr-0 Present Alarm Status

Attr-0 bit 0 - **Low Alarm**

Attr-0 bit 1 - **High Alarm**

Attr-0 bit 2 - **Fault Alarm**
e.g., Bad Sensor Fault (Input)
Time-out (Remote)
Verify (Output)

Attr-0 bit 3 - **COS Alarm**

Attr-0 bit 4 = **Lockout Status**
1 = locked out by other alarm.

Attr-0 bit 5,6 - **Alarm Priority**
0 = No Priority - Polling Only
1 = Lowest Priority
2 = Middle Priority
3 = Highest Priority - Critical Alarms

Attr-0 bit 7 - **Alarm Acknowledge**
1 = Acknowledged, 0 = not acknowledged

Attr-1 **Alarm Status Previous**

Attr-2 Status
Attr-2 bit 0 - **Last State of COS**
The last state of the Change of State target bit

Attr-2 bit 1 - **Alarm Event Flag** (FW700I.., FW740A..)
If Alarm Event Enable is set, This flag is set when ever LO, HI, FAULT, or COS changes value. It is cleared by an action 6 or by the appropriate Event Manager.

Attr-2 bit 2..7 - Spare

Attr-3 **Alarm Time Stamp**
in 1/8 hr increments for today.

Attr-4 **Action**
0 = No operation
1 = Acknowledge This Alarm & Clear COS Alarm
2 = No operation
3 = No operation
4 = Clear all RAM Attributes this index
5 = Acknowledge All Alarms (0..63) & Clear All COS Alarms
6 = Clear Alarm Event Flag (Attr-2 bit 1)(FW700I)

Attr-5 **Override Lockout Timer** (minutes)

Alarm STATIC Properties

Attr-6 Enable Alarm
1 = Yes, 0 = No
Attr-6 bit 0 - **Low Alarm Enable**
Attr-6 bit 1 - **High Alarm Enable**
Attr-6 bit 2 - **Fault Alarm Enable**
Attr-6 bit 3 - **Change of State Alarm Enable**
Attr-6 bit 4 - **Lock Enable**
Attr-6 bit 5,6 - **Alarm Priority** (0..3)
Attr-6 bit 7 - **Lockout Sense**
1 = Lockout when target bit is set
0 = Lockout when target bit is Not set

Attr-7 Lockout Configure
Attr-7 bit 0,1 - **Bit For Lockout**
0..3 Which target bit to Lock Against
0 = LOCK on another index lock bit
1 = Low Alarm
2 = High Alarm
3 = Fault Alarm
Attr-7 bit 2..7 = 0..63 - **Index for Lockout**
Which Alarm index to Lock Against (0..63)

Attr-8 Enables
.
Attr-8 Bit 0 - **Event Enable** (FW700I)
Attr-8 Bit 1..7 - Spare

Attr-9 **Trigger Object Number**
Identify which object to use to set all alarm bits for this Alarm.

Attr-10 **Trigger Index**
Identify which index to use to set all alarm bits for this Alarm.

Attr-11 **Trigger Attribute - Hi/Lo Alarm**

Identify which attribute of object number and index defined in Attr-9 and Attr-10 to use for High and/or Low Alarm (0..255)

Attr-12 Trigger Bits - High/Low Alarm

LONBL (bit 0..3) **Trigger Bits - Low Alarm**

0 = LO bit 0
...
7 = LO bit 7
8 = HI bit 0
...
15 = HI bit 7

HINBL (bit 4..7) **Trigger Bits - High Alarm**

0 = LO bit 0
...
7 = LO bit 7
8 = HI bit 0
...
15 = HI bit 7

Attr-13 **Trigger Attribute - COS/Fault**

Identify which attribute of object number and index defined in Attr-9 and Attr-10 to use for Fault and/or COS Alarm (0..255).

Attr-14 Trigger Bits - Configure Fault/COS Alarm of Target Obj, Index, and Attr.

LONBL (bit 0..3) **Trigger Bit - Fault Alarm**

HINBL (bit 4..7) **Trigger Bit - COS Alarm**

Attr-15 **Override Lockout Period**

in Minutes

Attr-16.. Attr-31 **Alarm Name**

Beginning with FW700i each index of the alarm object has a 16 character label.

Object 15 - Analog Output

Analog Output Summary

ANO-00
Analog Output

The Analog Output object provides the ability for the ASIC/2-7540, ASIC/2-7040 and ASIC/2-8040 to convert calculated output values into 0 to 10 Vdc Analog outputs.

Analog Outputs: Indexes 0 through 7 of the Analog Output object drive the ASIC/2-7540 and ASIC/2-7040 , 8 analog outputs. Indexes 0 through 3 drive the ASIC/2-8040's 4 analog outputs.

Note: Binary outputs are controlled by Object 3 - Binary Output

Analog Handles: Two handles are provided. The first handle points to the Unscaled Output Value used for the output. The second handle points to the Interlock Value used as the optional interlock.

Analog Interlocks: For analog outputs, the interlock on the auxiliary handle may be enabled , so that if the interlock value goes to zero, false, the output voltage goes to either Minimum or Maximum Output Voltage dependent on user definition.

Analog Voltage Characteristics: Voltage range for the outputs are 0 to 10 Vdc with 8 bit resolution (0..255) and accuracy of 0.4 % of full scale. An output can supply 5 mA at 10 Vdc. If 4 to 20 mA actuators are to be used, the user must provide an interfacing current driver. See below.

Voltage Scaling: Optionally, any analog output may be set-up to scale the Output Value from Minimum Output Voltage to Maximum output Voltage as the Unscaled Output Value goes from 0 to the Maximum Output Value.

Analog Output Operation

The Analog Output object defines the present values and setup parameters used by the controller to enable the analog output control block. The ASIC/2-8040 system controller provides 4 analog outputs designated AO-1 through AO-4 . The ASIC/2-7540 and ASIC/2-7040 provides 8 analog outputs designated AO-1 through AO-8.

For Analog outputs, the Unscaled Output Value goes from 0 to the Maximum Output Value, typically 255.

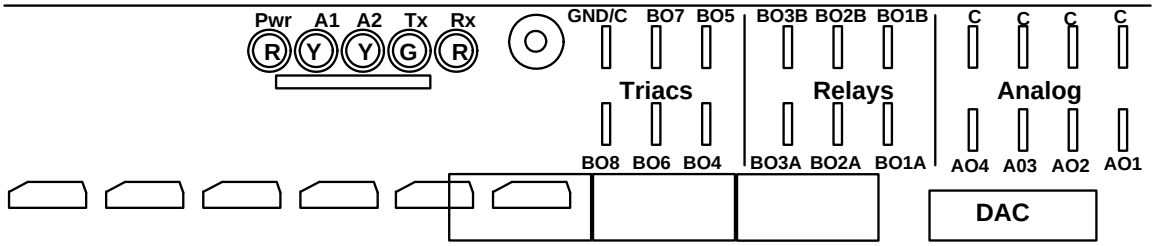
The analog outputs have an 8 bit resolution and an accuracy of 0.4 % full scale. The voltage outputs are referenced to board common and have a maximum current drive of 20 mA (ASIC/2-7540) ,or 5 mA (ASIC/2-7040, ASIC/2-8040) at 10 Vdc.

Note: The ASIC/2-7040 and ASIC/2-8040 outputs will not drive 4 to 20 mA actuators. If necessary to drive a 4 to 20 mA actuator, an interposing current driver with its own power supply must be provided.

If the index is not enabled, or if the application handle does not point to a valid object, index and attribute, then the output value is set to zero.

ASIC/2-8040 Analog Outputs

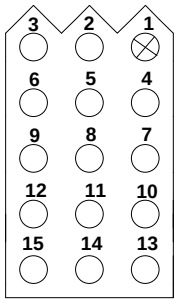
The ASIC/2-8040 system controller provides 4 analog outputs designated AO-1 through AO-4.



ASIC/2-7540, ASIC/2-7040 Analog Outputs

The ASIC/2-7540 and ASIC/2-7040 provides 8 analog outputs designated AO-1 through AO-8.

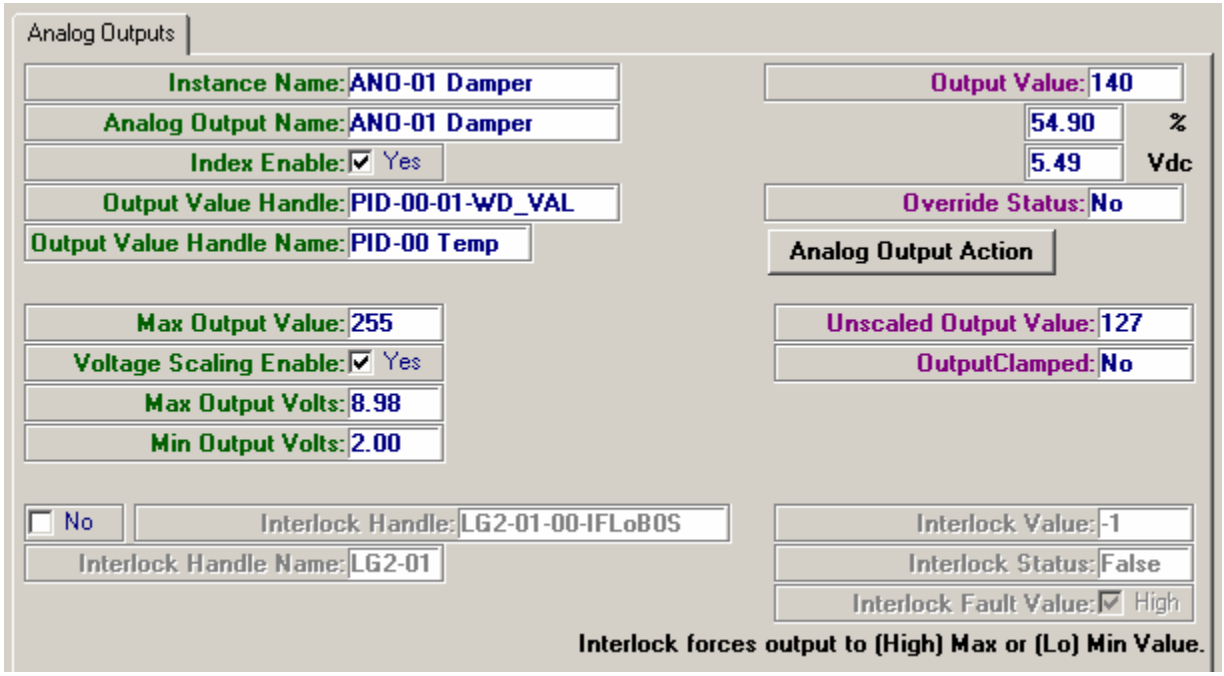
Analog Outputs



J3

AO-1	J3-1
AO Common	J3-4
AO-2	J3-7
AO Common	J3-10
AO-3	J3-9
AO Common	J3-12
AO-4	J3-2
AO Common	J3-5
AO-5	J3-8
AO Common	J3-11
AO-6	J3-3
AO Common	J3-6
AO-7	J3-13
AO Common	J3-14
AO-8	J3-15
AO Common	J3-12

Analog Output Configuration



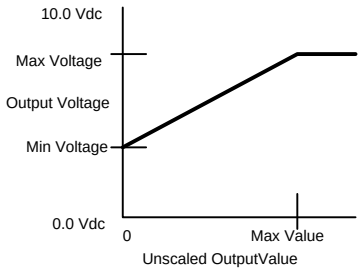
For Analog outputs, the **Output Value Handle** returns the Unscaled Output Value. , typically 0 to **Max Output Value**. If Voltage Scaling is not enabled, then the Voltage output goes from 0 to 10.0 Vdc as the **Unscaled Output Value** goes from 0 to 255.

Analog Output Voltage Scaling

If Voltage Scaling Enable is No, then the Unscaled Output Value goes from 0 to Maximum Output Value. If the Unscaled Output Value exceeds the Max Output Value, the Output Voltage is limited at

10.0 Volts*(Maximum Output Value/255)

and Output Clamped is set to Yes.



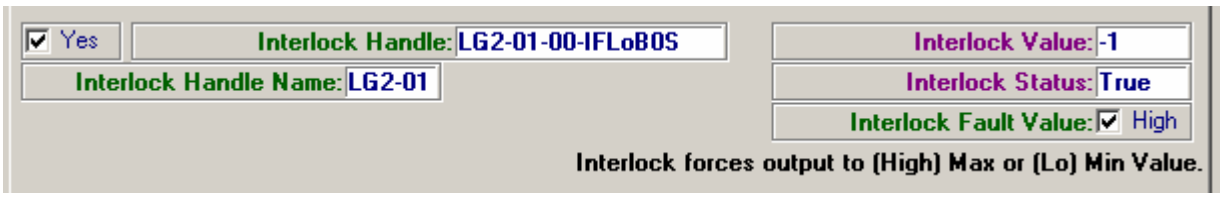
If **Voltage Scaling Enable** is yes, then the voltage output is scaled from **Min Output Voltage** to **Max Output Voltage**, as the **Unscaled Output Value** goes from 0 to the **Max Output Value**. If Min Output Voltage is less than Max Output Voltage then the slope is positive. If Min Output Voltage is greater than Max Output Voltage then the slope is negative.

The Maximum Output Value is used as a clamp to allow limiting unscaled outputs to a voltage lower than 10.0 Vdc.

$$OutputVoltage = (\frac{MaxVoltage - MinVoltage}{MaxValue}) * UnscaledValue + MinVoltage$$

Interlock

The Interlock can be used as an interlock to force the Analog Output to from **Min Output Voltage** or **Max Output Voltage** based on external logic.

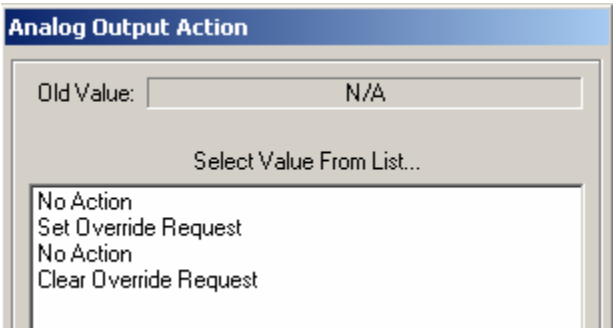


If **Interlock Enable** is yes, the value indicated by the Interlock handle is placed in the Interlock Value . The action taken depends on whether the **Interlock Value** is True or False, and whether the **Interlock Fault Value** is Hi or LO. If the Interlock Value is non-zero, then the Interlock Status is True and the normal analog output value is used. If the Interlock Value is zero, then the Interlock Status is False. The output will be forced to the Interlock Fault Value: either Low, the Minimum Output Voltage; or High , the Maximum Output Voltage.

If Interlock Enable is No, or if the handle does not point to a valid object, index and attribute, then the Interlock is ignored.

Analog Overrides

The Analog Output may be overridden by writing the **Set Override Request** value (1) to the **Analog Output Action.** When writing to action, the specified action is taken and the action is then reset to zero.



If the output is overridden, The **Override Status** flag is set, and the **Output Value** is no longer updated by the sequence. Writing a new Output Value changes the Output Voltage. When the override is cleared by writing the **Clear Override Request** value (3) to the action, then the sequence resumes control of the output.

Analog Output Glossary

Analog Output Parameters

Analog Output Action

Writing the following values to Action (15,X,4,WORD) causes the corresponding action to occur: 0, No operation.; 1, Override Output, Allow the user to write to Output Value; 2, No operation; 3,Clear Output Override

Analog Output Name

16-character String that describes the analog output. (15,X,16,STRING-16) 740/840C.

Index Enable

Enables this index for operation. User-configurable; "Yes", "No". (15,X,6,HIGH BIT 0)

Interlock Enable

Enables the Interlock feature for operation. If the Interlock is enabled (Attr-6,HI Bit 1 = 1), the value indicated by the Interlock handle is placed in the Interlock Value (Attr-1). User-configurable; "Yes", "No". (15,X,6,HIGH BIT 1)

Interlock Fault Value

Used in conjunction with Interlock, described above. If the Interlock is enabled, the action taken depends on whether the Interlock Value is true or false. and whether the Interlock Fault Value is Hi or LO. . If the Interlock Value is true (non-zero), then the normal analog output value is used. If the Interlock Value is false(zero) and the Interlock Fault Value is LO, (Attr-6,LO Bit 2= 0), then the output will be forced to zero value 0.0

Vdc. If the Interlock Value is false(zero) and the Interlock Fault Value is Hi (Attr-6,LO Bit 2 =1), and , then the output will be forced to the high value, 10.0 Vdc. User-configurable; "High", "Low". (15,X,6,LO BIT2)

Interlock Handle

Points to the external object, index, attribute from which the value for the Interlock is to be obtained. User-configurable. (15,X,12,3 BYTES)

Interlock Status

Interlock Status indicates if is active or not. (15,X,2,LO Bit 1)

Interlock Value

Interlock Value is used in conjunction with Interlock Fault Value to determine the output voltage when as the interlock goes false. For Interlock Fault Value = "High", a zero Interlock interlocks the output to Maximum Output Voltage; for Interlock Fault Value = "Low", a zero Interlock interlocks the output Minimum Output Voltage. Not user-changeable; integer. (15,X,1,WORD)

Maximum Output Value

If Voltage Scaling Enable is No, then the Unscaled Output Value goes from 0 to Maximum Output Value and the Output Voltage is limited at

10.0 Volts*(Maximum Output Value/255)

If Voltage Scaling Enable is yes, then the Voltage output is scaled from Minimum Output Voltage to Maximum Output Voltage as the Unscaled Output Value goes from 0 to Maximum Output Value. User changeable. (15,X, 8, WORD)

Maximum Output Voltage

The Maximum Output Voltage for voltage scaling.. If Voltage Scaling Enable is yes, then the Voltage Output is scaled from Min to Max as the Output value goes from 0 to Max Output Value. User changeable. 0..255 = 0 to 10.0 Vdc (15,X,7, HI Byte)

Minimum Output Voltage

The Maximum Output Voltage for voltage scaling.

Used to scale of Analog outputs. If Voltage Scaling Enable is yes, then the Voltage output is scaled from Min to Max as the Output value goes from 0 to Max Output Value. User changeable. 0..255 = 0 to 10.0 Vdc (15,X, 7,LO Byte)

Output Clamped

.If the Unscaled Output Value exceeds the Max Output Value, and Output Clamped is set to Yes. (15,X,2,LowBit 3)

Output Value

The present value of this index's output. This value controls the physical output. Not user-changeable; integer. (15,X,0,WORD)

Output Value Handle

Points to the location which contains the value to use as Output Value. User-configurable. (15,X,10,4 BYTES)

Override Status

Applies to all types of outputs: Indicates whether an output override is presently in effect. "Yes", "No"; user-configurable. (15,X,2,LO BIT 2)

Voltage Scaling Enable

Used to enable scaling of Analog outputs. The primary input is an Unscaled Output Value , typically 0 to Max Value which generates an analog voltage output from AO Minimum Voltage to AO Maximum Voltage. If not enabled then the Voltage output goes from 0 to 10.0 Vdc as the Unscaled Output Value goes from 0 to 255. (15,X,6,LowBit3)

Analog Output Properties

The ASIC/2-8040 provides 8 analog outputs designated AO-1 through AO-4 . The ASIC/2-7040 and ASIC/2-7540 provides 8 analog outputs designated AO-1 through AO-8. Analog Output defines the present values and setup parameters used by the controller to enable the analog output control block.

Object Name	Analog Output
Object Number	= 15
Data Type	= Word
Index	= 0..7 (AO-1..AO-7) ASIC/2-7040, -7540
Index	= 0..3 (AO-1..AO-3) ASIC/2-8040
Attributes	= 16 (0..15)
DYNAMIC Attributes	= 6 (0..5)
STATIC Attributes	= 10 (6..15)
	= 18 (6..23) FW740C,840C, 754

Firmware Revision - Analog Output

ASIC/2-7540 FW754A Rev 1.0 Forthcoming 2005

- As in FW740E.

ASIC/2-8040 FW840C Rev 1.0 Release 06/05/98 Chk 0D55h
ASIC/2-7040 FW740C Rev 1.0 Released 01/29/97

- Analog Output Instance Name

ASIC/2-8040 FW840A Rev 1.0, March 1996

ASIC/2-7040 FW740b Rev 1.2 Released 08/18/95
ASIC/2-7040 FW740A Rev 2.1 Released 08/16/95

- Fixed Analog Output Overrides from DAK.

ASIC/2-7040 FW740A Rev 1.1, (27 May 94)

- Fixed Output Value to handle to return 0 if null.

ASIC/2-7040 FW740A Rev 1.0, Alpha Test (31 March 94)

- New Object to support ASIC/2-7040 Analog Outputs

ASIC/2-7000 FW700I

- Analog outputs are the first 4 instance of object 3 – Outputs.

Analog Output DYNAMIC Properties

Attr-0 **Output Value** (word)

Data that will be used to generate a voltage output. 0 to 255 = 0 to 10 Vdc . If Output Value greater than 255, then the output is 10 Vdc.

Attr-1 **Interlock**

Signed Value (word) The raw value returned by the Interlock Handle if Interlock is enabled.

Attr-2 Output Status RAM

LO bit 0 - **Index Enable**

LO bit 1 - **Interlock Status**, "True, False"

LO bit 2 - **Override Status** "Yes, No"

Override Status indicates if the Output has been overridden.

1, Output Override - Disable application, .

0, No Output Override - Application is Enabled

LO bit 3 -**Output Clamped**

Set if Output Value Handle returns value greater than the Maximum Output Value.

LO bit 4 -
LO bit 5 -.
LO bit 6 -
LO bit 7 - Spare
HI Byte - Not Used

Attr-3 Spare - Not Used

Attr-4 **Action**

Writing value to this variable initiates an action. Action is cleared when action is completed. The output is overridden by writing Action = 1. When overridden, the Output Value is no longer updated by the sequence. A new value can be downloaded to the Output Value.

When the override is cleared by writing Action = 3, the sequence is re-enabled and the Output Value is again determined by the control block.

0 = No Operation
1 = Set Override Request. Disable application.
2 = No operation. Not Used for Analog Outputs
3 = Clear RAM Override flag. Resume application.

Attr-5 **Unscaled Output Value**

Unsigned Output Value returned by the Output Value Handle before scaling. If Output scaling is not used, then this value is the same as the Output Value.

Analog Output STATIC Properties

Attr-6 Setup 1 - Analog Output

LO bit 0 - **Index Enable**

1, Enabled; 0, Disabled.

LO bit 1 - **Interlock Enable**

If the Auxiliary is Enabled and the Interlock is false, then the output will be force to a voltage as given by a Interlock Fault Value. Otherwise the analog output will be normal as determined by the Output Value.

1, Enabled;; 0, Disabled.

LO bit 2 - **Interlock Fault Value**

0 = No (Low) , 1 = Yes (High)

If the Interlock is enabled, the action taken depends on whether the Interlock Value is true or false, and whether the Interlock Fault Value is Hi or LO. .If the Interlock Value is true (non-zero), then the normal analog output value is used. If the Interlock Value is false(zero) and the Interlock Fault Value is LO, (Attr-6,LO Bit2= 0), then the output will be forced to Minimum Output Value . If the Interlock Value is false(zero) and the Interlock Fault Value is Hi (Attr-6,LO Bit 2 =1), and , then the output will be forced to the Maximum Output Value

LO bit 3 - **Voltage Scaling Enable**

If enabled then the Voltage output is scaled from Min to Max as the Output value goes from 0 to Max Output Value.

If not enabled then the Voltage output goes from 0 to 10.Vdc as the Output value goes from 0 to 255.

LO bit 4 - Spare , Not Used
LO bit 5 - Spare , Not Used
LO bit 6 - Spare , Not Used
LO bit 7 - Spare , Not Used

HI Byte - Spare, Not Used

Attr-7 Voltage Range (**New FW740A..**)

LO Byte - **Minimum Output Voltage** (0..255 = 0 to 10.0 Vdc)
HI Byte - **Maximum Output Voltage**. (0..255 = 0 to 10.0 Vdc)

Attr-8 Setup 3 - **Maximum Output Value**

Attr-9 Setup 4 - Not Used

Attr-10,11 **Output Value Handle**

Attr-10 LO Byte - Output Value Handle - Object
Attr-10 HI Byte - Output Value Handle - Index
Attr-11 LO Byte - Output Value Handle - Attribute
Attr-11 HI Byte - Output Value Select

Attr-12,13 **Interlock Handle**

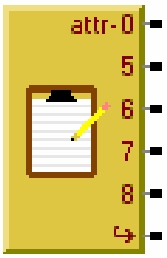
Attr-12 LO Byte - Interlock - Object
Attr-12 HI Byte - Interlock - Index
Attr-13 LO Byte - Interlock - Attribute
Attr-13 HI Byte - Interlock - Select

Attr-14,15 Not Used

Attr-16,23 **Analog Output Name** FW740C

Object 16 - Utility

Utility Summary



UTL-00
UTILITY

Overview: The Utility object is a place where setpoints and other parameters may be stored for use by other objects such as logic blocks, input look-up tables, etc. .

Applications: Any object may access information stored in the Utility object through a handle which points to the information it needs. Typical applications include: 33 entry look-up tables used in performing data conversions, and slope and offset constants for transducer reading conversions.

Memory Provided: Five volatile (DYNAMIC) and 34 non-volatile (STATIC) attributes are provided in each index of the utility object for FW754, FW700E..and FW200A.., and FW740A.. and FW840A.. Earlier versions had Five volatile (DYNAMIC) and 20 non-volatile (STATIC) attributes

The DYNAMIC attributes of index 0 are set with protocol messages received on the System Bus. The other DYNAMIC attributes can be used by host software to download override conditions, that can be used with logic to change the control sequence.

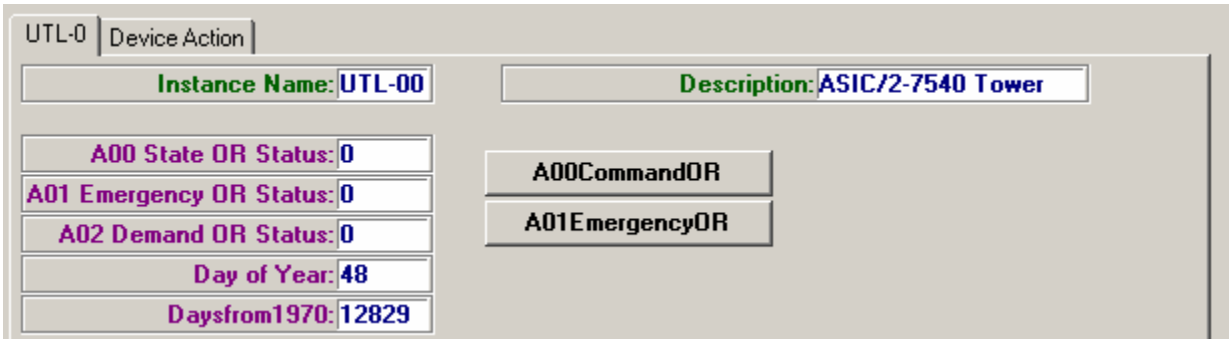
Utility Operation

An object 16-UTILITY is defined to provide tables of data which can be pointed to by various objects. The UTILITY object defines the setpoints and parameters used by other objects. The specific meaning of the data depends on the application.

The Utility object does not execute any code. Dynamic Data, DYNAMIC, is always zero unless set to some other value by communications. Static Data, STATIC Attributes, retain their values through loss of power .

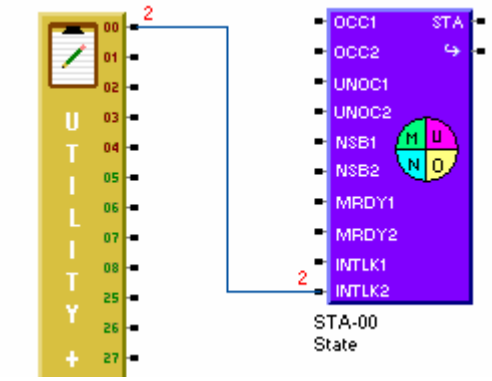
Override Data

Attributes in Utility object, Index 0, is used to store communication overrides. The ASIC/2 can to respond to certain protocol messages on the System Bus. These commands do not work on the Local Bus. The message set the value in UTL-0 Attr 0, 1, &2. The configuration must decide how to use the information.

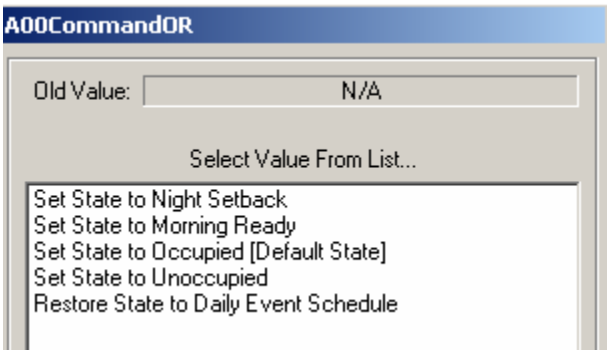


State Override

Index 0, Attr-0 is reserved for state override with message 10h. It can be used as an override to the state object.



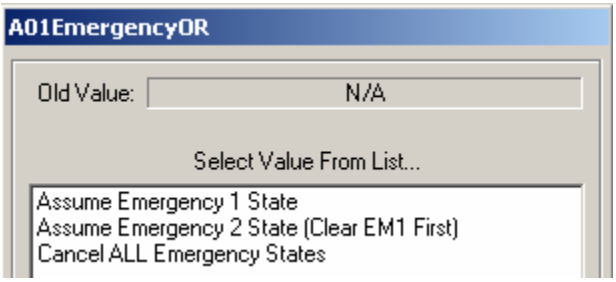
Command	ASI Message	Value
Override Night Setback	MT=10h, M1 = 3	Attr-0 = 3
Override Morning Ready	MT=10h, M1 = 4	Attr-0 = 4
Override Occupied	MT=10h, M1 = 5	Attr-0 = 2
Override Unoccupied	MT=10h, M1 = 6	Attr-0 = 1
Clear State Override	MT=10h, M1 = 7	Attr-0 = 0



Emergency Override

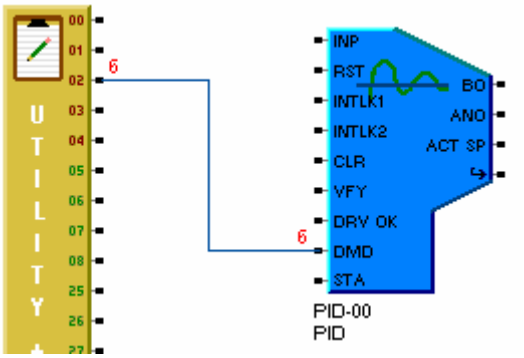
Index 0, Attr-1 is reserved for emergency override with message 12h. It can be used as an override to the sequence into emergency mode.

Command	ASI Message	Value
Override Emergency 1	MT=12h, M1 = 1	Attr-1 = 1
Override Emergency 2	MT=12h, M1 = 2	Attr-1 = 2
Clear Emergency	MT=12h, M1 = 3	Attr-1 = 0



Demand Limit Override

Index 0, Attr-2 is reserved for demand limit override with message 16h. .It can be used set PID Loops and Outputs in Demand Limit.



Command	ASI Message	Value
Demand Limit	MT=16h, M1 = Demand Level => Attr-2 LO Byte M2 = Demand Group => Attr-2 HI Byte	

Demand Limit Override is done only through TCL Scripting or downloading a value with the LinkOPC server.

```
proc UserAction {ActionID} {
   AutoDownload 1
   switch $ActionID {
    1000 {DeviceAction UTL_A02DemandORAction 6 0}
    }
}
```

Day Numbers

Day Numbers are calculates whenever the hardware clock is read, at power-up and at 11 min and 13 seconds after the hour.

> Note: TimeKeeper Enable MUST be enabled to do the calculation.

Day of Year

Index 0, Attr-3 is reserved for the Day of the current Year (1..365).
This can be used with a Function object to determine the time for sunrise and sunset using a custom Look-up function. It can also be used with Calculated Point object to determine the switching of lead or lag based on the passage of a number of days.
FW840A Rev 1.2 and later, FW740D Rev 1.4, FW740C, and later.

Days since 1970

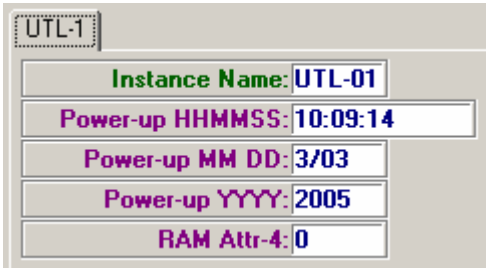
Index 0, Attr-4 is reserved for the number of Days since 1 Jan 1970.
FW840A Rev 1.2 and later, FW740D Rev 1.4, FW740C, and later.

Last Power-Down

When the controller looses power for any reason, it attempts to save the time and date of the power shutdown in non-volatile memory. If power bounces on and off this may not be possible. On restoration of power it reads the saved time and date stamp and loads it in Utility Index 1, Attr-0 through Attr-3 which is displayed. FW740C Rev 1.0 through FW740E1.6, 840E1.6

Last Power-up

If the power bounces up and down, the power shutdown time is not reliable. So with FW740E 1,7, 840E 1.7 and later and FW754A The Power-up time records the time when power was last restored to the controller.



Note: Power-up time is not supported in the SINC/3.

Utility Configuration

Description

Index 0, Attr-9 through Attr-25 are reserved for a 32 character controller description which is used by SETSYS or other host software systems to identify the specific controller application. This portion of memory

Linearization

Indexes are available for conversion parameters to support linear conversions. In the configuration of INPUT there is a parameter which points to the index of the table look up table. This is used for linear conversions, Linear-1, .. Linear-4;

$$\text{Value} = A*RAW/B + C$$

Example:

The conversion Y = A*X/B +C will have:

Attr-5 = 3 Number of entries
Attr-6 = A
Attr-7 = B
Attr-8 = C

Sensor Conversion

Indexes are available for parameters to support sensor conversions,. In the configuration of INPUT there is a parameter which points to the index of the table look up table. This is used for input Convert type 70, Sensor-1

$$[\text{Present Value}] = \frac{(\text{Raw} - \text{Raw Min})}{(\text{Raw Max} - \text{Raw Min})} * (\text{Input Max} - \text{Input Min}) + \text{Input Min}$$

Example:

Attr-5 =4 - Number of entries
Attr-6 = Raw Min
Attr-7 = Input Min
Attr-8 = Raw Max
Attr-9 = Input Max

Interpolation (8-bit)

Allocated Utility Indices are available for Look up tables to support piece-wise linear interpolation. In the configuration of INPUT there is a parameter which points to the index of the table look up table. This is used for interpolated 8 bit, 17 entry table look-up values, Look_up-1, ..., Look_up-4.

The 17 word look up table conversion Y = LOOK_UP(Raw) will have:

Attr-5 = 17 - Number of entries
Attr-6 = Entry 1 (0/16)
Attr-7 = Entry 2 (1/16)
...
Attr-21 = Entry 16 (15/16)
Attr-22 = Entry 17 (16/16)

If N = Integer(Raw/16), the value is give by

Value = Entry_N + (Entry_N+1 -Entry_N)*(Raw - N*16)/16

Note: The Lookup Convert Types always use 17 entries for 8-bit data conversion.

Interpolation (10-bit)

Allocated Utility Indices are available for Look up tables to support linear conversions. In the configuration of INPUT there is a parameter which points to the utility index of the look up table. This is used for interpolated 33 entry table look-up values, Look_up-1, and Look_up-3. ASIC/2-7040, FW740Aand later/

The 33 word look up table conversion Y = LOOK_UP(Raw) will have:

Attr-5 = 33 - Number of entries
Attr-6 = Entry 1 (0/32)
Attr-7 = Entry 2 (1/32)
...
Attr-21 = Entry 16 (15/32)
Attr-22 = Entry 17 (16/32)
Attr-23 = Entry 18 (17/32)
...
Attr-37 = Entry 32 (31/32)
Attr-38 = Entry 33 (32/32)

If N = Integer(Raw/32), the value is give by

Value = Entry_N + (Entry_N+1 -Entry_N)*(Raw - N*32)/32

Note: Attr-5 Number of entries is an information item which is not used by the algorithm. The Lookup Convert Types always use 33 entries for 10-bit data conversion.

Look-up Function

The Function object has a look-up type that can use the utility object to store upto 16 pairs of numbers used for piece-wise interpolation. uses

Allocated Utility Indices are available for Look up tables to support linear interpolation. In the configuration of Function Object there is a parameter which points to the utility index of the look up table. ASIC/2-7040, FW740Aand later/

Attr-5 = Number of pairs (2..16)
Attr-6 = X1
Attr-7 = Y1
...
Attr-22 = X8
Attr-23 = Y8
...
Attr-36 = X16
Attr-37 = Y16

If Xn <= (Raw) <=Xn+1

Value = Yn + (Yn+1 -Yn)*(Raw - Xn)/(Xn+1-Xn)

Utility Properties

Object Name	UTILITY
Object Number	16
Data Type	Word
Index	0..n as allocated
DYNAMIC Attributes	5 (0..4)
STATIC Attributes	34 (5..38)) FW700E..FW740A.., FW840A...

Utility Firmware Revision

ASIC/2-7540 FW754A Rev 1.0 Forthcoming 2005
- o as in FW740E.

ASIC/2-7040 FW740E Rev 1.7 Released 09/27/2000 CHK 0xE62A
ASIC/2-8040 FW840E Rev 1.7 Released 09/27/2000 CHK 0xCB80
- o Power Down is now Power Up Time in UTL-1, Attr-0..3
  Power Down was not reliable if power bounced.

SINC/3-3000 FW300B Rev 1.0 Released 10/06/1999 CHK 0x8FB7
- o Sinc/3 does not support Power Up Time.

ASI PN 70015-01ASIC/2-7040 FW740C Rev 1.0 Released 01/29/97
- o Adds report of Last Power-Down-
  UTL-1 Attr-0 LO Sec, HI Min
  UTL-1 Attr-1 LO Hours
  UTL-1 Attr-2 LO Day, HI Month
  UTL-1 Attr-3 (Year -1900)

ASIC/2-7040 FW740D Rev 1.4 Released 11/05/96
- o Utility object index 0 DYNAMIC now contains
  UTL-0 Attr-3 Day of year (0..365)
  UTL-0 Attr-4 Days since 1 Jan 1970

ASIC/2-8040 FW840A Rev 1.2 Released 4 Feb 1997
- o Utility object index 0 DYNAMIC now contains
  Attr-3 Day of year (0..365)
  Attr-4 Days since 1 Jan 1970

ASIC/2-8040 FW840A Rev 1.0, March 1996

ASIC/2-7040 FW740A Rev 1.0 Alpha Test (31 March 1994)
Attributes 39 (0..38)

ASIC/2-7000 FW700E Rev. 1.0, Released 17 July 1992
Increased size of Utility object for 33 entry look-up table.
Attributes 39 (0..38) FW700E.,FW200A..
Include Analog 10 bit ADC read on Input index 0,1,2,3
for use with Convert types 0,17,65,67,81 & 83

ASIC/2-7000 FW700A.. Rev 1.0 Released 12/05/91
SC/1-9040 FW907A Rev 1.0 Released 07/25/91
Attributes 25 (0..24) FW907A..C, FW700A..D

Utility DYNAMIC Properties

Attr-0 DYNAMIC Value
Index 0, Attr-0 is reserved for future state override with message 10h.
Index 1, Attr-0 LO Last Power-Down- Sec, HI Last Power-Down- Min
Last Power-Up - Sec, HI Last Power-Up- Min (FW7/840E 1.7)
UTL-1 Attr-0 LO Last Power-Down- Sec, HI Last Power-Down- Min
UTL-1 Attr-2 LO Last Power-Down- Day, HI Last Power-Down- Month
UTL-1 Attr-3 Last Power-Down- Year -1900

Attr-1 RAM Value
Index 0, Attr-1 is reserved for future emergency override with message 12h.
Index 1, Attr-1 LO Last Power-Down- Hours
Last Power-Up- Hours (FW7/840E 1.7)

Attr-2 RAM Value
Index 0, Attr-2 is reserved for future demand limit override with message 16h.
Index 1, Attr-2 LO Last Power-Down- Day, HI Last Power-Down- Month
Last Power-Up- Day, HI Last Power-Up- Month (FW7/840E 1.7)

Attr-3 RAM Value
Index 0, Attr-3 Day of year (0..365) FW740D1.4, 740C, 840A1.2
Index 1, Attr-3 Last Power-Down- Year -1900

Attr-4 RAM Value
Index 0, Attr-4 Days since 1 Jan 1970 FW740D1.4, 740C, 840A1.2

Utility STATIC Properties

Attr-6 STATIC Value
Attr-7 STATIC Value
Attr-8 STATIC Value

Attr-9 STATIC Value
Index 0, Attr-9..24 is reserved for the 32 character SC/1 description.

Attr-9 STATIC Value
Attr-10 STATIC Value
Attr-11 STATIC Value
Attr-12 STATIC Value
Attr-13 STATIC Value
Attr-14 STATIC Value
Attr-15 STATIC Value
Attr-16 STATIC Value
Attr-17 STATIC Value
Attr-18 STATIC Value
Attr-19 STATIC Value
Attr-20 STATIC Value
Attr-21 STATIC Value
Attr-22 STATIC Value
Attr-23 STATIC Value
Attr-24 STATIC Value

Attr-25 STATIC Value
Attr-26 STATIC Value
Attr-27 STATIC Value
Attr-28 STATIC Value
Attr-29 STATIC Value
Attr-30 STATIC Value
Attr-31 STATIC Value
Attr-32 STATIC Value
Attr-33 STATIC Value
Attr-34 STATIC Value
Attr-35 STATIC Value
Attr-36 STATIC Value
Attr-37 STATIC Value
Attr-38 STATIC Value

Object 17 - Poll Manager

Poll Manager Summary

Overview: Polling is the process of initiating requests for data from controllers on the local bus. The Poll Manager object is used to oversee the polling of ASIC/1 terminal unit controllers and ASIC/2 configurable controllers for their alarm status or other data. The Poll Managers work with the Poll List to gather information from controllers on the Local Bus. The address of each controller to be polled is kept in the Poll List.

Poll Instruction: Each Poll Manager index has a Poll Instruction that identifies which information to collect and where to put it.

Local Bus: The Poll Manager, Poll List, and Broadcast share the use of the local communication bus. Pass-through of messages from the system to the local bus also uses the local bus, has the highest priority, and interrupts the polling process. The broadcast object also periodically interrupts the polling process but waits for pass-through messages. A **Polling Priority Time** in the System Object allows completing a polling round at highest priority without interruption.

Polling Rounds: Polling on the local bus is conducted in successive rounds where each controller is polled once. The time it takes to complete a round of polling depends on the number of controllers being polled. At the end of each polling round it will wait for a **Polling Pause Time** (a System Object parameter) to allow other communication on the local bus.

Multiple Managers: Each index of the Poll Manager object can be configured with a Poll Instruction that collects data and with a Manager Function that summarizes data. The user configures each poll manager with a Scan Interval, a list of up to 4 **Poll Groups** (Authority Codes).

At the end of each polling round one poll manager is selected to become the **Active Poll Manager Index** for all controller in the poll list that have been assigned to it. This selection process is based on an internal scan count. The scan count is incremented after each round and is checked against each poll manager's unique **Scan Interval**.

If the scan count is evenly divisible by the Scan Interval, and it is the largest such Scan Interval, then that poll manager's index is selected to become Active Poll Manager Index on the next scan.

The selected poll manager loads its own Index number into the Active Poll Manager Index of all Poll List indexes whose Poll Group (Authority Code) matches one of its Poll Groups. Managers with a lower Scan Interval will be active more frequently. All poll mangers have an opportunity to participate. Each poll manager must have a **unique** Scan Interval.

On the next polling round, all indexes of the Poll List send their messages in turn and store the received data under control of their current Active Poll Manager Index.

Poll Groups (Authority Codes): Each poll manager index has a list of up to 4 Poll Groups (Authority Codes) for which this manager has responsibility. Each index of the Poll List object is assigned a single Poll Group (Authority Code).

Local Bus Assignment: The SINC/3 has two local busses and allows assigning the Poll Manager to Local 1 or Local 2 .

Manager Function: Each Poll Manager index has a **Manager Function** that identifies how the Poll List data is to be processed. Manager Functions include count number of alarms, count controllers by state, reset based on an alarm, etc. The Poll Manager can make summaries of alarm conditions, totals, averages, and calculate reset signals based on the data collected and stored in the Poll List. Other objects can use these values to change temperature and pressure setpoints and other control parameters to meet current conditions.

Poll Manager Operation

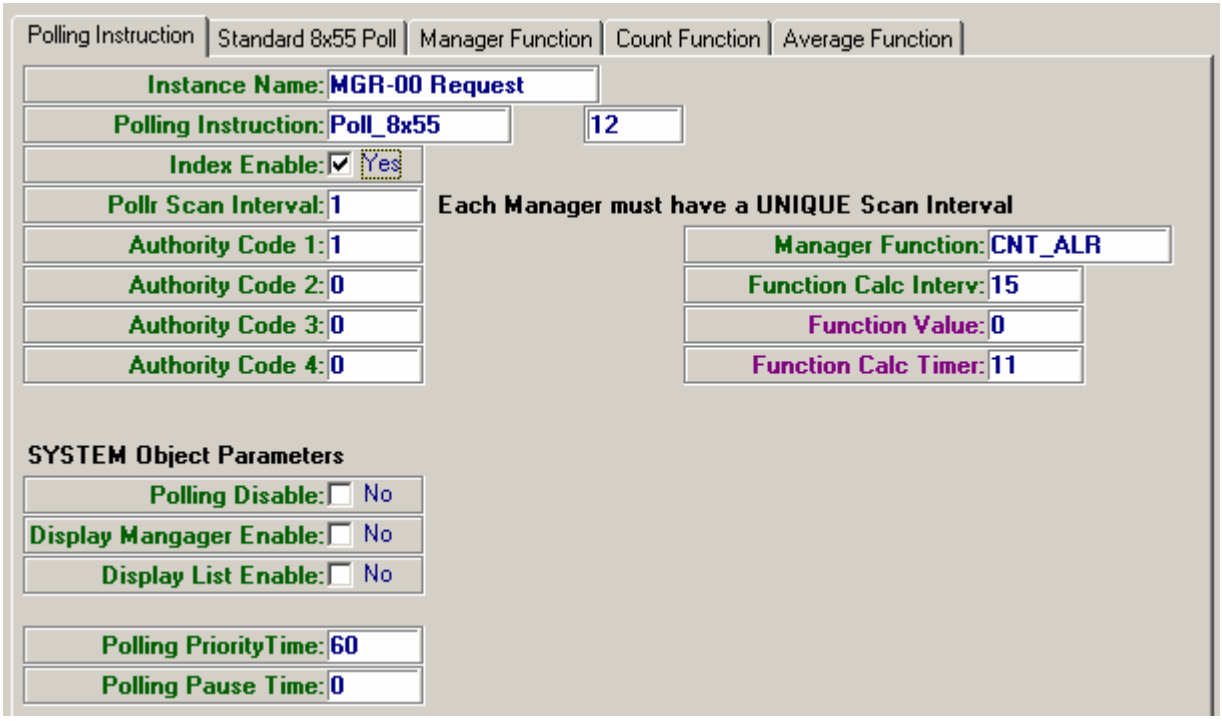
A Poll Manger Index has two distinct operations: the Poll Instruction and the Manager Function.

The Poll Instruction determines what data will be requested from which controllers in the poll list and how that data will be processed.

The Manager Function determines how data that has been collected and stored in the Poll List object is summarized or used for calculation.

A Poll Manger Index may have a Manager Function, or a Poll Instruction or Both. If the Manager Function is zero, then it is controlling polling only. If the Poll Instruction is zero, the Poll Manager only using data requested by other poll managers.

Note: For polling to take place the **Polling Disable** in System Object must be No.



The Polling Process

Polling is the process of gathering information from controller on the local communication bus. The addresses of all controllers to be polled are listed in the Poll

List object. The data obtained from polling is processed according to the Poll Instruction and the results are saved in dynamic memory in the Poll List.

Polling Rounds

Polling is performed in rounds. Each poll list index starting with the first index checks to see if Poll List Index Enable is yes, and then examines its Active Poll Manager Index number, placed there prior to starting the polling round by the Active Poll Manager. The poll message defined in the active poll manager is sent out on the local bus and the response message is processed based on the Poll Instruction. The next Poll List index is examined and continues until the last index of the poll list has been processed. The time it takes to complete a round of polling depends on the number of controllers being polled.

All enabled indexes of the Poll List send their messages and store received data under control of their Active Poll Manager Index.

At the end of each polling round an internal scan count, is incremented. The internal Scan Count is used to identify the Active Poll Manager for the next polling round.

Scan Interval

Before the start of the next polling round each poll manager is examined and one is selected to be the Active Poll Manager Index.

Each poll manager index contains a unique Scan Interval. Each poll manager must have a different Scan Interval value. Those managers with a lower Scan Interval will be selected more frequently. All poll mangers have an opportunity to participate.

If the Scan Count is evenly divisible by the Scan Interval, and it is the largest such Scan Interval, then that poll manager is selected as the Active Poll Manager.

Poll Groups (Authority Codes)

Each Poll Manager index contains four Poll Groups (Authority Codes) that identify up to four sets of controllers that are 'authorized' to utilize that Poll Manager's instructions. Once the Active Poll Manager has been selected, each index of the Poll List is examined to determine if it should be controlled by the Active Poll Manager.

If the Pole Group (Authority Code) of a Poll List index matches one of the four Poll Groups (Authority Codes) in the Active Poll Manager, that poll manager's index number is inserted into the Poll Manager Index of the Poll List index. Poll Group (Authority Code) 0 does not count as a match.

Those poll list indexes without a matching Poll Group are unchanged and continue to collect the same data on the next polling round.

Polling Parameters (System Object)

Polling Disable Polling Disable must be No. If Polling Disable is Yes, then the controller will stop polling.

Polling Pause Time: The controller will wait a Polling Pause Time (System Object parameter) before beginning the next polling round.

Polling Priority Time: If there is a lot of communication traffic on the local bus, polling may be interrupted by broadcast and pass through communications. The Polling Priority Time (System object parameter) is a maximum time to wait between the end of a polling round and the beginning of a new polling. Once the Priority Time has been reached, then the polling takes highest priority until the end of the current round.

Poll Message

Each Poll Manager index has an ASI protocol Poll Message that is used to request data.

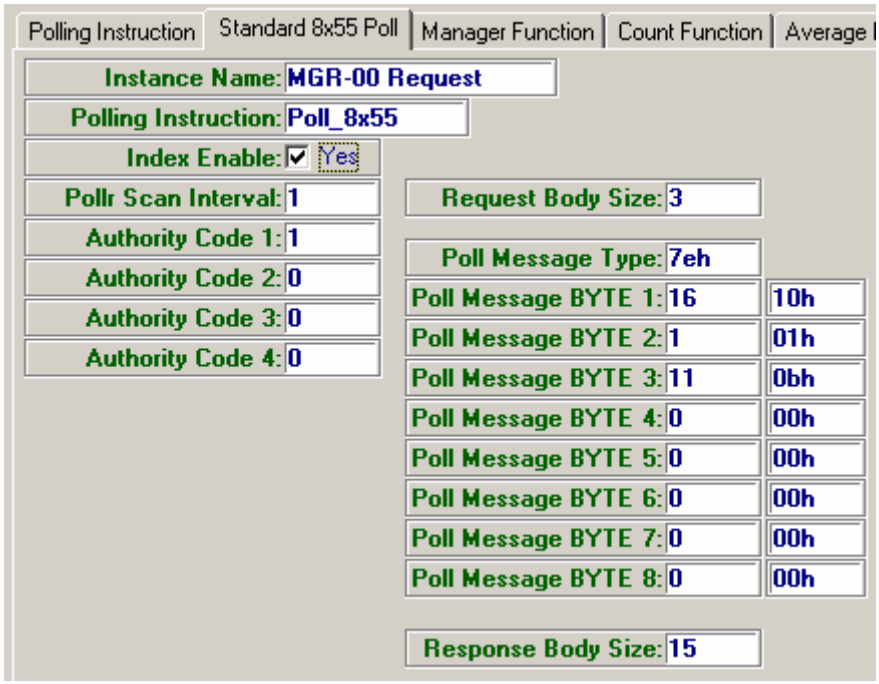
Poll Message Type : The ASI Protocol Message Type, e.g.,0x7E. (always in hex)

Poll Request Body Size: Number of message body bytes to transmit.

Poll Message Byte 1 .. 8 : The specific message bytes to be sent. Those not needed are zero.

The response message body is unpacked and organized under the direction of the Poll Instruction. You must specify the response message size.

Poll Response Body Size : Number of message body bytes expected in the response.



Poll Instruction

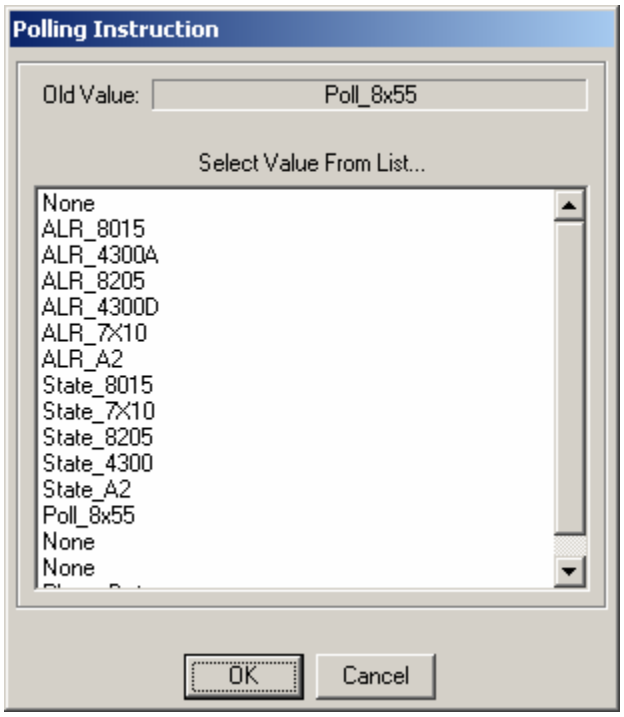
Each Poll Manager index contains a Poll Instruction that is used to unpack and organize the response message body during the polling cycle.

Poll Instruction 0, no polling.

Poll Instructions 1..6 return alarm information

Poll Instructions 7..11 return control mode and state information.

Poll Instruction 15 places specific data in the Dynamic Data Bytes.



The following Poll Instructions have been implemented.

0 = None, No Polling
1 = Alarm Polling ASIC/1-8010, ASIC/1-8015
2 = Alarm Polling ASIC/1-4300 (304A..)
3 = Alarm Polling ASIC/1-8205
4 = Alarm Polling ASIC/1-4300 (304D..)
5 = Alarm Polling ASIC/1-7X10
6 = Alarm Polling ASIC/2
7 = Mode and State Polling ASIC/1-8010, ASIC/1-8015
8 = Mode and State Polling ASIC/1-7X10
9 = Mode and State Polling ASIC/1-8205
10 = Mode and State Polling ASIC/1-4300, ASIC/1-8305
11 = ASIC/2 State Polling
12= ASIC/1-8X55 Alarm/Mode/State Polling
13 = None
14. = None
15 = General Place Data

Note: Polling for ASIC/2 Alarms and State is new.

Note: If Poll Instruction = 0, No Polling, If Poll Manager Index is enabled, then the manager function will be executed on the data collected by the other managers.

Poll Manager Functions

The Manager Functions performs designated calculations on data already collected and saved in the Poll List at the Function Calculation Interval. Each poll manager performs its function calculation for all controllers with one of its 4 polling Poll Groups (Authority Codes). The manager does not wait for the end of a polling round. Controllers that are in Communication Error are not included in the function calculation.

The Manager function defines the type of data accumulation or reset calculation to be perform by the poll manager. Manager functions include:

Count Functions, based on alarm, mode, state, or bit.
Reset Functions
Average Functions
Min/Max Functions

Count Functions

Certain poll Manager Functions count the number of controllers in the Poll List that meet certain conditions. Controllers that are not communicating are not included in the function calculation. The result of this is generally placed in the Function Value (Attr-0) of the Poll Manager. Count Functions include:

1 -	Count Alarms	
	(Alarm 1 HI)	High Zone Temperature Alarm
	(Alarm 1 LO)	Low Zone Temperature Alarm
	(Alarm 2 HI)	High Airflow Alarm
	(Alarm 2 LO)	Low Airflow Alarm
	(Afterhours Status)	Afterhours Requests
	(Request to Operate)	HP Operate Requests
4,5	Count Mode Requests	
	4 -	Count Requests for Cooling
	5 -	Count Requests for Heating
10..13	Count State Requests	
	10 -	Count Requests for Unoccupied State
	11 -	Count Requests for Occupied State
	12 -	Count Requests for NSB State
	13 -	Count Requests for Morning Ready State
38..45-	Alarm Status 1	Count Alarm Status 1, bit 0..7
46..53-	Alarm Status 2	Count Alarm Status 2, bit 0..7
54..61-	Polling Status	Count Polling Status, bit 0..7
	60	Count Afterhours Requests
	61	Count Heat Pump Requests

Function Value: The count function value is calculated based on the number of controllers with the condition. The count function value is accessed by other objects which adjust control setpoints or set alarm. For example, if the number of zones in high and low temperature alarm exceeds some value then an alarm could be set in the controller.

Reset Function

Certain poll Manager Functions calculate a reset Function Value based on the number of controllers in the Poll List that meet the conditions. Controllers that are not communicating are not included in the count. Reset Functions include:

2,3	Reset Based on Mode	
	2 -	Requests for Cooling
	3 -	Requests for Heating
6..9	Reset Based on State	
14..21	Reset Based on Alarm Status 1, bit 0..7	
	14 -	Alarm 1 HI High Zone Temperature Alarm
	15 -	Alarm 1 LO Low Zone Temperature Alarm
	17 -	Alarm 2 LO Low Airflow Alarm

22..29 Reset Based on Alarm Status 2, bit 0..7

30..37 Reset Based on Polling Status, bit 0..7

36 -	Afterhours Requests
37 -	HP Operate Requests

Function Value: The reset function value is calculated based on the number of controllers with the condition. The reset function value is accessed by other objects which adjust control setpoints. For example, if 2 out of 15 terminal unit controllers have low air flow alarms, then the reset signal may be used by the PID object to adjust the duct static pressure control setpoint upwards. The reset calculation uses signed arithmetic.

Control Count: Every Function Calculation Interval, the poll manager counts the number of controllers meeting the functional conditions. For example, the control count could equal the total number of heat pump controllers requesting operation. Or the number of zones in high zone temperature alarm. The control count is not displayed by the reset poll manager.

Upper/Lower Reset Threshold: The Upper and Lower Reset Threshold are used to increase or decrease the reset Function Value is defined. If the control count is above the upper count threshold, the reset signal is incremented by the user-defined add increment. If the control count is below the lower count threshold, the reset signal is decremented by the user-defined drop increment.

If the reset is direct acting (Reverse Acting = No) and the number meeting the condition are greater than the Reset Upper Threshold, then the value of the Function Value is increased by the Reset Add Increment.

If the reset is direct acting (Reverse Acting = No)and the number meeting the condition are less than the Reset Lower Threshold, then the value of the Function Value is decreased by the Reset Drop Increment.

Reverse Acting: If the reverse acting option is chosen, then the reset signal is incremented where it would have been decremented above, and visa-versa.

If the reset is reverse acting (Reverse Acting = Yes) and the number meeting the condition are less than the Reset Lower Threshold, then the value of the Function Value is increased by the Reset Add Increment.

If the reset is reverse acting (Reverse Acting = Yes)and the number meeting the condition are greater than the Reset Upper Threshold, then the value of the Function Value is decreased by the Reset Drop Increment.

Upper/Lower Reset Limit : The reset function value is initially set to the midpoint of the Upper and Lower Reset Limits. The poll manager compares the reset Function Value with the upper and lower limits. The reset function value may never go outside the Reset Upper Limit and Reset Lower Limit. The result of this is placed in the Function Value (Attr-0) of the Poll Manager.

Average Function

Certain poll Manager Functions calculate the average of values based on specific data in the Poll List. The function can include or exclude zero values. Controllers that are not communicating are not included in the determination.

Perform Reset on the Average Data (including 0 data) for specific Poll List Data
62..69= Reset on Average Data in Poll Data Byte 1..8
Note: This has been revised in FW740A to include Min, Max, Average and Reset

Perform Reset on the Average Data (excluding 0 data) for specific Data
78..85 = Average Data in Poll Data Byte 1..8
Note: This has been revised in FW740A to replace 102..109, and 118..125

Attr-0,LO	Reset Value LO
Attr-0,HI	Reset Value HI
Attr-1,LO	Min Value-
Attr-1,HI	Max Value -
Attr-2,LO	Average Value (Integer)
Attr-2,HI	Average Value (Fraction)

Attr-3,LO	Number of Values Used
Attr-3,HI	Dynamic Data 6

Calculate Average of Byte Data (including 0 data) for specific Data
70..77 = Average Data in Poll Data Byte 1..8
Note: This is revised to include Min, Max, Average and Total

Calculate Average of Data (excluding 0 data) for specific Data
86..93 = Average Data in Poll Data Byte 1..8
Note: This is revised to replace 102..109, and 118..125

Attr-0,LO	Average Value (Int)
Attr-0,HI	Average Value (Fraction)
Attr-1,LO	Min Value-
Attr-1,HI	Max Value -
Attr-2,LO	Total Value LO
Attr-2,HI	Total Value HI
Attr-3,LO	Number of Values Used
Attr-3,HI	Dynamic Data 6

Min/Max Function

Certain poll Manager Functions calculate the minimum or maximum of values based on specific data in the Poll List. Controllers that are not communicating are not included in the average.

Perform Reset on the Minimum Data for specific Data
94..101= Minimum Data in Poll Data Byte 1..8

Calculate Minimum Data for specific Data ***(Replaced FW740A..)***
102..109 = Minimum Data in Poll Data Byte 1..8 (FW907A Only)
Note: In FW740 this is deleted and replaced by 70..77 or 86..93

Calculations using Maximum Data

Perform Reset Based on Maximum Data for specific Data
110..117 = Maximum Data in Poll Data Byte 1..8

Calculate Maximum Data for specific Data
118..125 = Maximum Data in Poll Data Byte 1..8 (FW907A..only)
Note: In FW740A.. this function is deleted and replaced by 70..77 or 86..93

Calculations using Words of Specific Data

Calculate Average Word Value **(New FW740A..)**
118..121 = Average Word Value in Poll Data Byte 1-2,3-4,5-6,7-8

Attr-0	Average Word Value
Attr-1	LO WORD Total of Values
Attr-2	HI WORD Total of Values
Attr- 3 LO	Number of Values Used

Maximum Data for specific Data

Calculate Min/Max Word Value**(New FW740A..)**
122..125 Min/Max Word Value in Poll Data Byte 1-2,3-4,5-6,7-8

Attr-0	Maximum Word Value
Attr-1	Minimum Word Values
Attr-2	
Attr- 3 LO	Number of Values Used

Polling Example

The Scan Interval and Poll Group (Authority Code)allow Each Poll Manager to become active in turn. As an example of interaction between the poll manager and the poll list, consider the following the example of 4 poll manager indexes which are performing different functions on three different Poll Group (Authority Code)s.

Poll Manager

Poll Manager Index	Scan Interval	Poll Group	Poll Instruction
0	1	1,3	1 - ASIC/1-8015 Alarm Polling
1	2	2	2 - ASIC/1-4300 Alarm Polling
2	7	3	7 - ASIC/1-8015 Mode/State
3	15	3	15 - Place Data (Zone Temp)

Poll List

Poll List Index	Poll Group	Data to be Collected
0	1	;ASIC/1-8015 Alarm only
:	:	: :
5	3	;ASIC/1-8015 Alarm Mode/State and Zone Temp
6	1	;ASIC/1-8015 Alarm Polling only.
:	:	: :
19	2	;ASIC/1-4300 Alarm only.
:	:	: :
25	2	: :

Polling Rounds

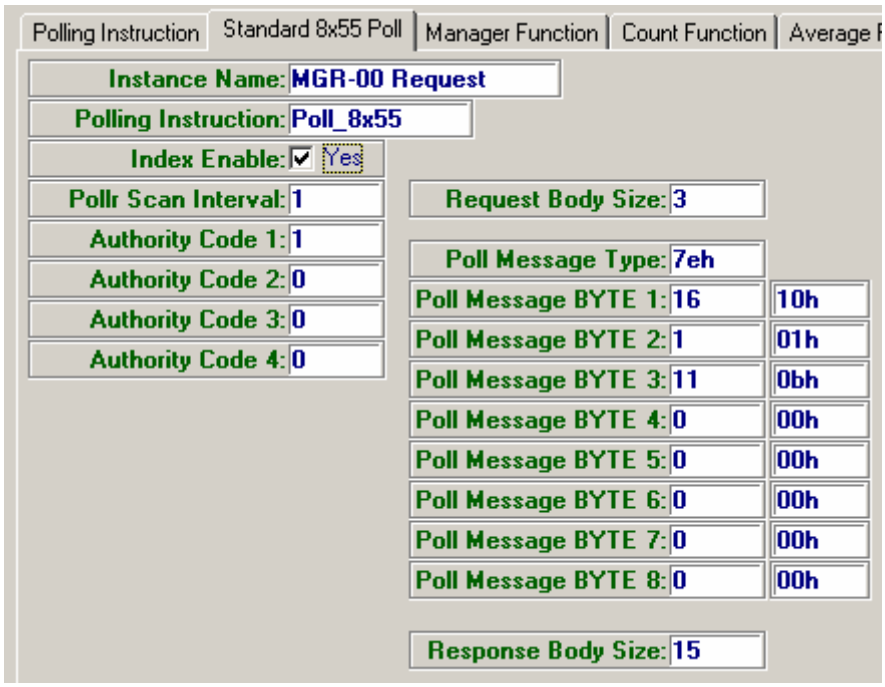
This example would result in a series of polling round as follows:

Round	Poll List Indexes	Mgr Idx	Data
:			
5th Round:	Poll indexes 0..18	0	ASIC/1-8015 Alarms
	Poll indexes 19..25	1	ASIC/1-4300 Alarms
6th Round:	Poll indexes 0..18	0	ASIC/1-8015 Alarms
	Poll indexes 19..25	1	ASIC/1-4300 Alarms
7th Round:	Poll index 5	2	ASIC/1-8015 Mode/State
	Poll indexes 0..4,6..18	0	ASIC/1-8015 Alarms
	Poll indexes 19..25	1	ASIC/1-4300 Alarms
8th Round:	Poll index 5	2	ASIC/1-8015 Mode/State
	Poll indexes 0..4,6..18	0	ASIC/1-8015 Alarms
	Poll indexes 19..25	1	ASIC/1-4300 Alarms
9th Round:	Poll indexes 0..18	0	ASIC/1-8015 Alarms
	Poll indexes 19..25	1	ASIC/1-4300 Alarms
:			
14th Round:	Poll index 5	2	ASIC/1-8015 Mode/State
	Poll indexes 0..4,6..18	0	ASIC/1-8015 Alarms
	Poll indexes 19..25	1	ASIC/1-4300 Alarms
15th Round:	Poll index 5	3	ASIC/1-8015 Zone Temp
	Poll indexes 0..4,6..18	0	ASIC/1-8015 Alarms
	Poll indexes 19..25	1	ASIC/1-4300 Alarms
16th Round:	Poll index 5	3	ASIC/1-8015 Zone Temp
	Poll indexes 0..4,6..18	0	ASIC/1-8015 Alarms
	Poll indexes 19..25	1	ASIC/1-4300 Alarms
17th Round:	Poll indexes 0..18	0	ASIC/1-8015 Alarms
	Poll indexes 19..25	1	ASIC/1-4300 Alarms
:			
21st Round:	Poll index 5	2	ASIC/1-8015 Mode/State
	Poll indexes 0..4,6..18	0	ASIC/1-8015 Alarms
	Poll indexes 19..25	1	ASIC/1-4300 Alarms :

ASIC/1-8x55 Polling

A Poll Instruction 12, Poll_8x55 is used for polling Alarms, Mode, State, and controller parameters from the ASIC/1-8x55 Polling Table 16. It combines the features of Alarm, Mode/State, and Place Data in a single poll instruction. For many applications this is the only poll instruction you will need.

Poll Instruction 12 can be used with the ASIC/1-8655 Packaged AC, ASIC/1-6000 VAV, ASIC/1-8055 VAV, ASIC/1-8255 Fan Coil, ASIC/1-8355 Packaged AC and ASIC/1-8755 Tracking Controllers.



Poll Instruction 12 (ASIC/1-8x55 Polling Table)

Poll Message:

MT	M1	M2	M3	M4	M5	M6	M7	M8
7Eh	16	1	11	0	0	0	0	0
Get	Alarm							

Request Body Size: 3, The Table message has 3 body bytes.

Response Body Size: 15. The ASIC/1-8x55 table messge returns 15 response bytes.

ACK	DB1	DB2	DB3	DB4	DB5	DB6	DB7	DB8
06h	7Eh	16	1	11	E1	E2	E3	E4
	RS0	RS1	RS2	RS3	RS4	RS5	RS6	RS7
	Get	Table	Entry	Num	Alr1	Alr2	Poll	ZT

DB9	DB10	DB11	DB12	DB13	DB14	DB15	CHK
E5	E6	E7	E8	E9	E10	E11	
RS8	RS9	RS10	RS11	RS12	RS13	RS14	
C SP	H SP	Outs	Val	Val	Val	Val	

Alarm Data

E1, Alarm Status 1

Response Byte	Poll List Data
DB5, Bit 0 ->	Attr-0 Bit 0 Alarm 1 HI Zone Temperature
DB5, Bit 1 ->	Attr-0 Bit 1 Alarm 1 LO Zone Temperature
DB5, Bit 2 ->	Attr-0 Bit 2 Alarm 2 HI
DB5, Bit 3 ->	Attr-0 Bit 3 Alarm 2 LO
DB5, Bit 4 ->	Attr-0 Bit 4 Alarm3 HI
DB5, Bit 5->	Attr-0 Bit 5 Alarm 3 LO

DB5, Bit 6 -> Attr-0 Bit 6 Alarm 4 HI
DB5, Bit 7-> Attr-0 Bit 7 Alarm 4 LO

E2, Alarm Status 2

Response Byte	Poll List Data
DB6, Bit 0 ->	Attr-1 Bit 0 Alarm 5 HI
DB6, Bit 1 ->	Attr-1 Bit 1 Alarm 5 LO
DB6, Bit 2 ->	Attr-1 Bit 2 Alarm 6 HI
DB6, Bit 3 ->	Attr-1 Bit 3 Alarm 6 LO
DB6, Bit 4 ->	Attr-1 Bit 4 Alarm 7 HI
DB6, Bit 5->	Attr-1 Bit 5 Alarm 7 LO
DB6, Bit 6 ->	Attr-1 Bit 6 Alarm 8 HI
DB6, Bit 7->	Attr-1 Bit 7 Alarm 8 LO

Mode/State Data

E3, Mode State

Response Byte	Poll List Data
DB7, Bit 0,1 ->	Attr-2 Bit 0,2 Control Mode 0=DB, 1 = CLG, 2 = HTG, 3= NA
DB7, Bit 2,3 ->	Attr-2 Bit 2,3 Control State 0=UNO, 1 = OCC, 2 = NSB, 3= MRDY
DB7, Bit 4 ->	Attr-2 Bit 4 Reserved (Acknowledge)
DB7, Bit 5->	Attr-2 Bit 5Reserved (Communication Error)
DB7, Bit 6 ->	Attr-2 Bit 6 Afterhours Status
DB7, Bit 7->	Attr-2 Bit 7 Special Request (Heat Pump Request)

Place Data

Relocate Source: 0 The Relocate Source (RS0..RS15) depends on the response message. Poll Instruction 12 always assumes relocate source = RS7. The value in the configuration is ignored.

Relocate Destination: 0 The Relocate Destination (RS0..RS15) depends on the response message. Poll Instruction 12 always assumes relocate Destination = RD0. The value in the configuration is ignored.

Relocate Number of bytes: 0 The Relocate Number of bytes identifies the number of bytes to be transferred from the Relocate Source to Relocate Destination. Poll Instruction 12 always assumes relocate number of bytes = 8. The value in the configuration is ignored.

Poll Instruction12 takes the response bytes and processes them as follows:

Response Byte	**Poll List Data**
DB8 ->Val	(RS7) Attr-6 Poll Data Byte 1, E4
DB9 ->Val	(RS8) Attr-7 Poll Data Byte 2, E5
DB10 -> Val	(RS9) Attr-8 Poll Data Byte 3, E6
DB11 -> Val	(RS10) Attr-9 Poll Data Byte 4, E7
DB12 -> Val	(RS11) Attr-10 Poll Data Byte 5, E8
DB13 -> Val	(RS12) Attr-11 Poll Data Byte 6, E9
DB14 -> Val	(RS13) Attr-12 Poll Data Byte 7, E10
DB15 ->1 Val	(RS14) Attr-13 Poll Data Byte 8, E11

Place Data Polling

Poll Instruction 15 is used for Placing Data received from a controller in the Polled Data Bytes of the Poll List. Up to 8 bytes of data from the response message may be copied to the Polled Data Bytes starting at the Relocate Source (RS0 ..RS15) to the Relocate Destination (RD0..RD7)

More than one poll manager may work on the same Poll List index. Care must be taken that they do not step on one another's data. For instance, if the poll instruction includes dynamic data such as zone temperature, then the response data bytes should be saved in Dynamic Data Bytes that do not overlay the information requested by a different manager..

Relocate Source: The relocate source (RS0..RS15) depends on the response message.

Response Message

ACK	DB1	DB2	DB3	DB4	DB5	DB6	...	DB12
06h	7Eh	10	9	8	E9	E10	...	E16
	RS0	RS1	RS2	RS3	RS4	RS5	...	RS11

Relocate Destination: The relocate destination depends on where in the poll list you wish to place the data. Note: Each attribute of the Poll List object is a single byte.

Relocate Destination		**Poll List**
RD0	->	Attr-6 Poll Data Byte 1
RD1	->	Attr-7 Poll Data Byte 2
RD2	->	Attr-8 Poll Data Byte 3
RD3	->	Attr-9 Poll Data Byte 4
RD4	->	Attr-10 Poll Data Byte 5
RD5	->	Attr-11 Poll Data Byte 6
RD6	->	Attr-12 Poll Data Byte 7
RD7	->	Attr-13 Poll Data Byte 8

Relocate Number of Bytes: Identifies the number of bytes to be transferred from the Relocate Source to the Relocate Destination.

Poll Instruction15 (VAV Data)

Example: VAV Zone Temperature Data

The ASIC/1-8015 VAV Controllers have single byte Zone Temperature value that we wish to place in Poll Data Bytes 1.

Poll Message:

MT	M1	M2	M3	M4	M5	M6	M7	M8
77h	8	0	0	0	0	0	0	0

Request 1 bytes of data Zone Temperature

Request Body Size:1, Request Temperature

Response Body Size: 1 The ASIC/1-8015 Zone Temperature message returns 1 response byte.

ACK	DB1
06h	Temp
	RS0

Poll Instruction: 15 Place Data

Relocate Source: 0 (RS0 = DB1)

Relocate Number of Bytes: 1

Relocate Destination: 0, RD0 = Poll Data Byte 1

Poll Instruction 15 takes the response bytes and processes them as follows:

Response Byte		Poll List Data
Data Byte 1(RS0)->	ZT	(RD0)Attr-06 Poll Data Byte 1

Poll Instruction15 (Unitary Data)

Example: Unitary Zone Temperature using Tables

The ASIC/1-7X10 Unitary Controllers have single byte DAT, Zone Temperature, and OAT values that we wish to place in Poll Data Bytes 6, 7, & 8.

Poll Message:

MT	M1	M2	M3	M4	M5	M6	M7	M8
7Eh	10	42	3	0	0	0	0	0
Get	Table	Entry	Num					

Request 3 bytes of data from Table 10, starting at entry 42: DAT, ZT, OAT

Request Body Size: 3, Request Temperatures

Response Body Size: 7 The ASIC/1-7X10 table message returns 7 response bytes.

ACK	DB1	DB2	DB3	DB4	DB5	DB6	DB7
06h	7Eh	10	42	3	E42	E43	E44
		Table	Entry	Num	DAT	ZT	OAT
	RS0	RS1	RS2	RS3	RS4	RS5	RS6

Poll Instruction: 15 Place Data

Relocate Source: 4 (RS4 = DB5)

Relocate Number of bytes: 3

Relocate Destination: 5, RD5 = Poll Data Byte 6

Poll Instruction15 takes the response bytes and processes them as follows:

Response Byte		**Poll List Data**
DB5(RS4)->	DAT	(RD5) Attr-11 Poll Data Byte 6
DB6(RS5)->	ZT	(RD6) Attr-12 Poll Data Byte 7
DB7(RS6)->	OAT	(RD7) Attr-13 Poll Data Byte 8

Alarm Polling

Poll Instruction 1(VAV Alarms)

Poll Instruction 1 is used for polling Alarms in the ASIC/1-8010 FW137H.., ASIC/1-8015, FW150A.., and ASIC/1-8710 FW 142A.. controllers. The configuration of the Poll Manager requires the following. Consult the appropriate ASI Communication Protocol Document for details.

Poll Message:

MT	M1	M2	M3	M4	M5	M6	M7	M8
11h	5	0	0	0	0	0	0	0
Get	Alarm							

Request Body Size: 1, Request Alarm Status

Response Body Size: 1 Alarm Status returns one response byte.

ACK	M1	M2	...
06	Alarm		

The Poll Instruction 1 then takes this response byte and processes it as follows:

Response Byte	**Poll List Data**
Data Byte 1, Bit 0 ->	Attr-0 Bit 0 Alarm 1 HI Zone Temperature
Data Byte 1, Bit 1 ->	Attr-0 Bit 1 Alarm 1 LO Zone Temperature
Data Byte 1, Bit 2 ->	Attr-0 Bit 2 Alarm 2 HI Primary Airflow
Data Byte 1, Bit 3 ->	Attr-0 Bit 3 Alarm 2 LO Primary Airflow
Data Byte 1, Bit 4->	Attr-0 Bit 5 Alarm 3 LO Spare
Data Byte 1, Bit 5 ->	Attr-0 Bit 6 Alarm 4 HI Spare
Data Byte 1, Bit 6 ->	Attr-2 Bit 6 In Afterhours

Poll Instruction 3 (Fan Coil Alarms)

Poll Instruction 3 is used for polling Alarms in the ASIC/1-8205, FW251A.. controllers. The configuration of the Poll Manager requires the following. Consult the appropriate ASI Communication Protocol Document for details.

Poll Message:

MT	M1	M2	M3	M4	M5	M6	M7	M8

7Eh	10	9	4	0	0	0	0	0
Get	Table	Entry	Num					

Request 4 bytes of data from Table 10, starting at entry 9

Request Body Size: 3 The table message has 3 body bytes.

Response Body Size: The ASIC/1-8205 table message returns 8 response bytes.

ACK	DB1	DB2	DB3	DB4	DB5	DB6	DB7	DB8
06h	7Eh	10	9	4	E 9	E10	E11	E12
	Get	Table	Entry	Num				

Poll Instruction 3 : takes the response bytes and processes them as follows:

Response Byte	**Poll List Data**
DB5, Bit 0 ->	Attr-0 Bit 0 Alarm 1 HI Zone Temperature
DB5, Bit 1 ->	Attr-0 Bit 1 Alarm 1 LO Zone Temperature
DB5, Bit 2 ->	Attr-0 Bit 2 Alarm 2 HI Primary Airflow
DB5, Bit 3 ->	Attr-0 Bit 3 Alarm 2 LO Primary Airflow
DB5, Bit 4 ->	Attr-0 Bit 6 Alarm3 HI Spare
DB5, Bit 5->	Attr-0 Bit 4 Alarm 3 LO Spare
Data Byte 8, Bit 2 ->	Attr-1 Bit 0 Alarm 5 HI
Data Byte 8, Bit 3 ->	Attr-1 Bit 1 Alarm 5 LO
Data Byte 8, Bit 4 ->	Attr-1 Bit 2 Alarm 6 HI
Data Byte 8, Bit 5->	Attr-1 Bit 3 Alarm 6 LO
Data Byte 8, Bit 6 ->	Attr-1 Bit 4 Alarm 7 HI
Data Byte 8, Bit 7 ->	Attr-1 Bit 5 Alarm 7 LO
Data Byte 7, Bit 2 ->	Attr-2 Bit 6 In Afterhours

Poll Instruction 4 (Heat Pump Alarms)

Poll Instruction 4 is used for polling Alarms in the ASIC/1-4300 and ASIC/1-8305, FW304C... controllers. The configuration of the Poll Manager requires the following. Consult the appropriate ASI Communication Protocol Document for details.

Poll Message:

MT	M1	M2	M3	M4	M5	M6	M7	M8
7Eh	10	26	3	0	0	0	0	0
Get	Table	Entry	Num					

Request 3 bytes of data from Table 10, starting at entry26

Request Body Size: 3 The table message has 3 body bytes.

Response Body Size: 7 The ASIC/1-8305 table message returns7 response bytes.

ACK	DB1	DB2	DB3	DB4	DB5	DB6	DB7	DB8
06h	7Eh	10	26	3	E26	E27	E28	
	Get	Table	Entry	Num				

Poll Instruction 4 : takes the response bytes and processes them as follows:

Response Byte	**Poll List Data**
Data Byte 6, Bit 0 ->	Attr-0 Bit 0 Alarm 1 HI Zone Temperature
Data Byte 6, Bit 1 ->	Attr-0 Bit 1 Alarm 1 LO Zone Temperature
Data Byte 6, Bit 2 ->	Attr-0 Bit 2 Alarm 2 HI DAT
Data Byte 6, Bit 3 ->	Attr-0 Bit 3 Alarm 2 LO DAT
Data Byte 6, Bit 4->	Attr-0 Bit 4 Alarm 3 HI Water Loop
Data Byte 6, Bit 5->	Attr-0 Bit 5 Alarm 3 LO Water Loop
DB5, Bit 5 ->	Attr-1 Bit 1 Alarm 5 LO Overflow Fault
Data Byte 7, Bit 3->	Attr-1 Bit 3 Alarm 6 LO Auxiliary Fault
Data Byte 6, Bit 6->	Attr-2 Bit 6 In Afterhours
DB5, Bit 3 ->	Attr-2 Bit 7 Heat pump Request

Poll Instruction 5 (Unitary Alarms)

Poll Instruction 5 is used for polling Alarms in the ASIC/1-7X10 and ASIC/1-8715, FW158A... controllers. The configuration of the Poll Manager requires the following. Consult the appropriate ASI Communication Protocol Document for details.

Poll Message:

MT	M1	M2	M3	M4	M5	M6	M7	M8

7Eh	10	9	5	0	0	0	0	0
Get	Table	Entry	Num					

Request 5 bytes of data from Table 10, starting at entry 9

Request Body Size: 3 The table message has 3 body bytes.

Response Body Size: 9 The ASIC/1-7X10 table message returns 9 response bytes.

ACK	DB1	DB2	DB3	DB4	DB5	DB6	...	DB9
06h	7Eh	10	9	5	E9	E10	...	E13
	Get	Table	Entry	Num				

Poll Instruction 5 : takes the response bytes and processes them as follows:

Response Byte	**Poll List Data**
DB5, Bit 0 ->	Attr-0 Bit 0 Alarm 1 HI Zone Temperature
DB5, Bit 1 ->	Attr-0 Bit 1 Alarm 1 LO Zone Temperature
DB5, Bit 2 ->	Attr-0 Bit 2 Alarm 2 HI
DB5, Bit 3 ->	Attr-0 Bit 3 Alarm 2 LO
DB5, Bit 4->	Attr-0 Bit 4 Alarm 3 HI
DB5, Bit 5->	Attr-0 Bit 5 Alarm 3 LO
DB5, Bit 6->	Attr-0 Bit 6 Alarm 4 HI
DB5, Bit 7->	Attr-0 Bit 7 Alarm 4 LO
Data Byte 6, Bit 2 ->	Attr-1 Bit 0 Alarm 5 HI
Data Byte 6, Bit 3 ->	Attr-1 Bit 1 Alarm 5 LO
Data Byte 6, Bit 4->	Attr-1 Bit 2 Alarm 6 HI
Data Byte 6, Bit 5->	Attr-1 Bit 3 Alarm 6 LO
Data Byte 6, Bit 6->	Attr-1 Bit 4 Alarm 7 HI
Data Byte 6, Bit 7->	Attr-1 Bit 5 Alarm 7 LO
Data Byte 9, Bit 0->	Attr-2 Bit 6 In Afterhours

Mode and State Polling

Poll Instruction 7 (VAV Mode/State Alarms)

Poll Instruction 7 is used for polling Mode and State in the ASIC/1-8010 FW137H.., ASIC/1-8015, FW150A.., and ASIC/1-8710 FW 142A.. controllers. The configuration of the Poll Manager requires the following. Consult the appropriate ASI Communication Protocol Document for details.

Poll Message:

MT	M1	M2	M3	M4	M5	M6	M7	M8
13h	1	0	0	0	0	0	0	0
Get	Status							

Request Body Size: 1, Request Operating Status

Response Body Size: 6 Operating Status returns 6 response bytes.

ACK	DB1	DB2	DB3	DB4	DB5	DB6	...	DB9
06h	State	Mode	Aft	Sens	Alarm	Em		

Poll Instruction 7 takes the response bytes and processes them as follows:

Response Byte	**Poll List Data**
Data Byte 2, (1..4)->(0..3)->	Attr-2 Bits 0,1 of Polling Status (Mode)
Data Byte 1, (1..4)->(0..3)->	Attr-2 Bits 2,3 of Polling Status (State)

Poll Instruction 8 (Unitary Mode/State)

Poll Instruction 8 is used for polling Mode and State in the n the ASIC/1-7X10 FW7X1A.. controllers. The configuration of the Poll Manager requires the following. Consult the appropriate ASI Communication Protocol Document for details.

Poll Message:

MT	M1	M2	M3	M4	M5	M6	M7	M8
7Eh	10	7	2	0	0	0	0	0
Get	Table	Entry	Num					

Request 2 bytes of data from Table 10, starting at entry7

Request Body Size: 3, Request Operating Status

Response Body Size: 6 The ASIC/1-7X10 table message returns 6 response bytes.

ACK	DB1	DB2	DB3	DB4	DB5	DB6
06h	7Eh	10	9	5	E7	E8
		Table	Entry	Num	State	Mode

Poll Instruction 8 takes the response bytes and processes them as follows:

Response Byte	**Poll List Data**
Data Byte 6, Bit 0,1->	Attr-2 Bits 0,1 of Polling Status (Mode)
DB5, Bit 0,1->	Attr-2 Bits 2,3 of Polling Status (State)

Poll Instruction 9 (Fan Coil Mode/State)

Poll Instruction 9 is used for polling Mode and State in the n the ASIC/1-8205 FW251A.. controllers. The configuration of the Poll Manager requires the following. Consult the appropriate ASI Communication Protocol Document for details.

Poll Message:

MT	M1	M2	M3	M4	M5	M6	M7	M8
7Eh	10	5	2	0	0	0	0	0
Get	Table	Entry	Num					

Request 2 bytes of data from Table 10, starting at entry 5

Request Body Size: 3, Request Operating Status

Response Body Size: 6 The ASIC/1-8205 table message returns 6 response bytes.

ACK	DB1	DB2	DB3	DB4	DB5	DB6
06h	7Eh	10	9	5	E5	E6
		Table	Entry	Num	State	Mode

Poll Instruction 9 takes the response bytes and processes them as follows:

Response Byte	**Poll List Data**
Data Byte 6, Bits 4,5->	Attr-2 Bits 0,1 of Polling Status (Mode)
DB5, Bits 0,1->	Attr-2 Bits 2,3 of Polling Status (State)

Poll Instruction10 (Heat Pump Mode/State)

Poll Instruction 10 is used for polling Mode and State in the ASIC/1-8305 FW304C... controllers. The configuration of the Poll Manager requires the following. Consult the appropriate ASI Communication Protocol Document for details.

Poll Message:

MT	M1	M2	M3	M4	M5	M6	M7	M8
7Eh	10	5	2	0	0	0	0	0
Get	Table	Entry	Num					

Request 2 bytes of data from Table 10, starting at entry 5

Request Body Size: 3, Request Operating Status

Response Body Size: 6 The ASIC/1-8305 table message returns 6 response bytes.

ACK	DB1	DB2	DB3	DB4	DB5	DB6
06h	7Eh	10	9	5	E5	E6
	Get	Table	Entry	Num	State	Mode

Poll Instruction10 takes the response bytes and processes them as follows:

Response Byte	**Poll List Data**
Data Byte 6, Bit 0,1->	Attr-2 Bits 0,1 of Polling Status (Mode)
DB5, (1..4)->(0..3)->	Attr-2 Bits 2,3 of Polling Status (State)

ASIC/2 Polling

Poll Instruction 6 (ASIC/2 Alarms) NEW!

Poll Instruction 6 is used for polling Alarms in the ASIC/2-7000 and ASIC/2-7040 controllers. The configuration of the Poll Manager requires the following. Consult the appropriate ASI Communication Protocol Document for details.

Poll Message:

MT	M1	M2	M3	M4	M5	M6	M7	M8
91h	1	14	0	0	4	1	4	0
Get	Byte	OBJ	IDX	Attr	N_idx	N_attr	Count	

Request 4 bytes of data from Object 14, Index 0, Attr-0, 1 attribute,4 indexes

Request Body Size: 7 The object read message has 7 body bytes.

Response Body Size: 13 The ASIC/2-7000 object get message returns 13 response bytes.

ACK	DB1	DB2	DB3	DB4	DB5	DB6	DB7	DB8	
06h	91h	1	14	0	0	4	1	4	77
	Get	Byte	OBJ	IDX	Attr	N_idx	N_attr	Count	
	DB9	DB10	DB11	DB12	DB13				
	Frame	A0	A1	A2	A3				

Poll Instruction 6 : takes the response bytes and processes them as follows:

Response Byte	**Poll List Data**
DB10, Bit 0 ->	Attr-0 Bit 0 Alarm 1 HI
DB10, Bit 1 ->	Attr-0 Bit 1 Alarm 1 LO
DB10, Bit 2 ->	Attr-0 Bit 2 Alarm 2 HI (Fault)
DB10, Bit 3 ->	Attr-0 Bit 3 Alarm 2 LO (COS)
DB11, Bit 0 ->	Attr-0 Bit 4 Alarm 3 HI
DB11, Bit 1 ->	Attr-0 Bit 5 Alarm 3 LO
DB11, Bit 2 ->	Attr-0 Bit 6 Alarm 4 HI (Fault)
DB11, Bit 3 ->	Attr-0 Bit 7 Alarm 4 LO (COS)
DB12, Bit 0 ->	Attr-1 Bit 0 Alarm 5 HI
DB12, Bit 1 ->	Attr-1 Bit 1 Alarm 5 LO
DB12, Bit 2 ->	Attr-1 Bit 2 Alarm 6 HI (Fault)
DB12 Bit 3 ->	Attr-1 Bit 3 Alarm 6 LO (COS)
DB13, Bit 0 ->	Attr-1 Bit 4 Alarm 7 HI
DB13, Bit 1 ->	Attr-1 Bit 5 Alarm 7 LO
DB13, Bit 2 ->	Attr-1 Bit 6 Alarm 8 HI (Fault)
DB13, Bit 3 ->	Attr-1 Bit 7 Alarm 8 LO (COS)

Poll Instruction 11 (ASIC/2 State) NEW!

Poll Instruction 11 is used for polling State in the ASIC/2 controllers. The configuration of the Poll Manager requires the following. Consult the appropriate ASI Communication Protocol Document for details.

Poll Message:

MT	M1	M2	M3	M4	M5	M6	M7	M8
91h	2	8	0	0	1	1	2	0
Get	Word	OBJ	IDX	Attr	N_idx	N_attr	Count	

Request 2 bytes of data from Object 8 Index 0, Attr-0, 1attribute, 1 index

Request Body Size: 7 The object read message has 7 body bytes.

Response Body Size: 10 The ASIC/2-7000 object get message returns 12 response bytes.

ACK	DB1	DB2	DB3	DB4	DB5	DB6	DB7	DB8
06h	91h	2	8	0	0	1	1	2
	Get	Word	OBJ	IDX	Attr	N_idx	N_attr	Count
	DB9	DB10	DB11					
	77	A0 LO	A0 HI					
	Frame							

Poll Instruction 11 takes the response bytes and processes them as follows:

Response Byte	**Poll List Data**
Data Byte10, (1..4)->(0..3)->	Attr-2 Bits 2,3 of Polling Status (State)

Poll Instruction 15 (ASIC/2 Data)

Example: ASIC/2 Data

Poll Instruction 15 Place Data can be used to return the present value(Word) of Input 3 (index 2) and place it in Poll Data Bytes 4 and 5

Poll Message:

MT	M1	M2	M3	M4	M5	M6	M7	M8
91h	2	5	2	0	1	1	2	0
Get	Word	OBJ	IDX	Attr	N_idx	N_attr	Count	

Request 2 bytes of data from Object 5, Index 2, Attr-0, 1 attribute,1 indexes

Request Body Size: 7 The object read message has 7 body bytes.

Response Body Size: 11 The ASIC/2-7000 object get message returns 11 response bytes.

ACK	DB1	DB2	DB3	DB4	DB5	DB6	DB7	DB8
06h	91h	2	5	2	0	1	1	1
	Get	Word	OBJ	IDX	Attr	N_idx	N_attr	Count

DB9	DB10	DB11
77	A0 LO	A0 HI
Frame	RS9	RS10

Poll Instruction: 15 Place Data

Relocate Source: 9 (RS9 = DB10)

Relocate Number of Bytes: 2

Relocate Destination: 3, RD3 = Poll Data Byte 4

Poll Instruction 15 takes the response bytes and processes them as follows:

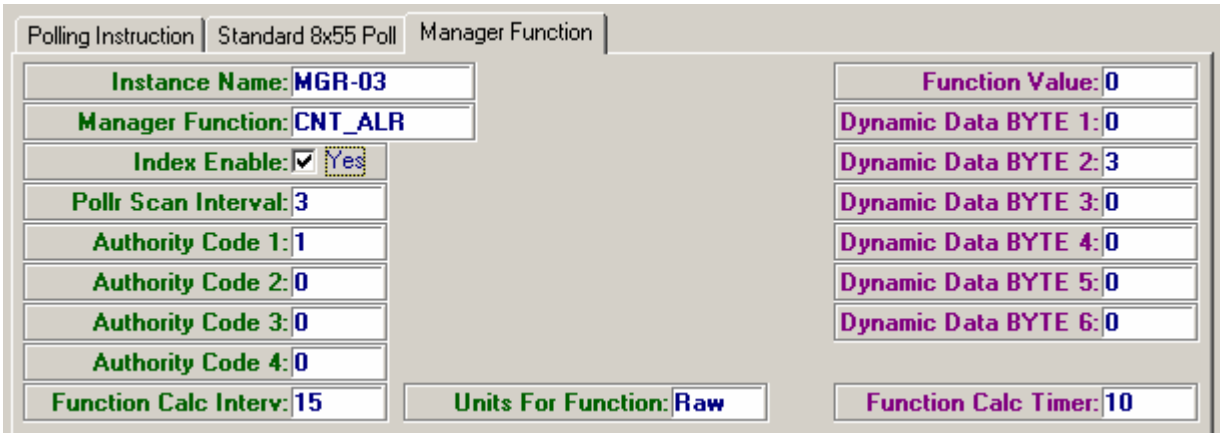
Response Byte	**Value**	**Poll List Data**
DB10(RS9)->	IN-3 LO	(RD3)Attr-08 Poll Data Byte4
DB11(RS10)->	IN-3 HI	(RD4)Attr-09 Poll Data Byte5

Poll Manager Functions

Not Used

Manager Function = 0, Not used. There are occasions when one wishes to use the manager for special polling, but not do any summarizing or calculation. If the Manager Function is not used, and the Poll Manager Index is enabled, then polling will proceed as identified by the Poll Instruction.

Count Alarms

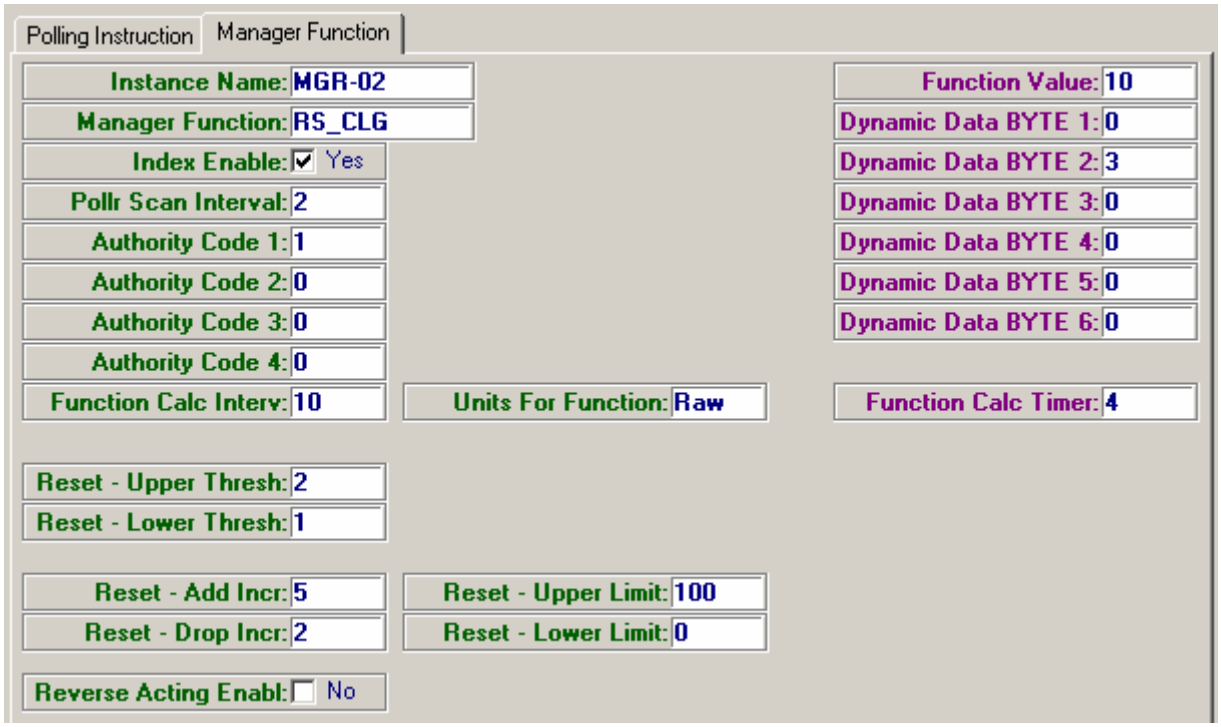


Manager Function = 1, Count the number of controllers with certain Alarms

Attr-0	Function Value - Not Used
Attr-1,LO	Dynamic Data 1 - Alarm 1 Low (Zone Temperature)
Attr-1,HI	Dynamic Data 2 - Alarm 1 High (Zone Temperature)
Attr-2,LO	Dynamic Data 3 - Alarm 2 Low (VAV Airflow)
Attr-2,HI	Dynamic Data 4 - Alarm 2 High (VAV Airflow)
Attr-3,LO	Dynamic Data 5 - Afterhours Status
Attr-3,HI	Dynamic Data 6 - Operate Request (Heat Pump)

Reset Based on Mode

Examines Poll List, Attr-2, Bits 0,1 (0=DB, 1=CLG, 2=HTG)
2,3 Reset/Count based on Mode Attr-2, Bits 0,1



Manager Function = 2, Function Value = Reset based on Cooling Mode
Manager Function = 3, Function Value = Reset based on Heating Mode

Attr-0	Function Value
Attr-1,LO	Dynamic Data 1 - Number in Deadband
Attr-1,HI	Dynamic Data 2 - Number in Cooling
Attr-2,LO	Dynamic Data 3 - Number in Heating
Attr-2,HI	Dynamic Data 4 - Spare
Attr-3,LO	Dynamic Data 5 - Spare
Attr-3,HI	Dynamic Data 6 - Spare

Count Based on Mode

Examines Poll List, Attr-2, Bits 0,1 (0=DB, 1=CLG, 2=HTG)
4..5 Count based on Mode Attr-2, Bits 0,1

Manager Function = 4, Function Value = Count based on Cooling Mode
Manager Function = 5, Function Value = Count based on Heating Mode

Attr-0	Function Value
Attr-1,LO	Dynamic Data 1 - Number in Deadband
Attr-1,HI	Dynamic Data 2 - Number in Cooling
Attr-2,LO	Dynamic Data 3 - Number in Heating
Attr-2,HI	Dynamic Data 4 - Spare
Attr-3,LO	Dynamic Data 5 - Spare
Attr-3,HI	Dynamic Data 6 - Spare

Reset Based on State

Examines Poll List, Attr-2, Bits 2,3 (0=UNOCC, 1=OCC,2=NSB, 3=MRDY)
6..9= Reset based on State Attr-2, Bits 2,3

Manager Function = 6, Function Value = Reset based on UNOCC State
Manager Function = 7, Function Value = Reset based on OCC State
Manager Function = 8, Function Value = Reset based on NSB State
Manager Function = 9, Function Value = Reset based on MRDY State

Count Based on State

Examines Poll List, Attr-2, Bits 2,3 (0=UNOCC, 1=OCC,2=NSB, 3=MRDY)
10..13 = Count based on State Attr-2, Bits 2,3

Manager Function = 10, Function Value =- Count based on UNOCC State
Manager Function = 11, Function Value = Count based on OCC State
Manager Function = 12, Function Value = Count based on NSB State
Manager Function = 13, Function Value = Count based on MRDY State

Attr-0	Function Value
Attr-1,LO	Dynamic Data 1 - Number in UNOCC State
Attr-1,HI	Dynamic Data 2 - Number in OCC State
Attr-2,LO	Dynamic Data 3 - Number in NSB State
Attr-2,HI	Dynamic Data 4 - Number in MRDY State
Attr-3,LO	Dynamic Data 5 - Spare
Attr-3,HI	Dynamic Data 6 - Spare

Reset Based on Alarms

Reset Based on 13-Poll List, Attr-0 - Alarm Status 1
14..21= Reset based on Attr-0 - Alarm Status 1 bit 0..7

Note: Meaning of alarm depends on product being polled , For Example, in the ASIC/1-8015 VAV Alarm 2 LO is the low airflow alarm.

Manager Function = 14, Reset based on Attr-0 -Bit 0 Alarm 1 HI Zone Temp
Manager Function = 15, Reset based on Attr-0 -Bit 1 Alarm 1 LO Zone Temp
Manager Function = 16, Reset based on Attr-0 -Bit 2 Alarm 2 HI
Manager Function = 17, Reset based on Attr-0 -Bit 3 Alarm 2 LO
Manager Function = 18, Reset based on Attr-0 -Bit 4 Alarm 3 HI
Manager Function = 19, Reset based on Attr-0 -Bit 5 Alarm 3 LO
Manager Function = 20, Reset based on Attr-0 -Bit 6 Alarm 4 HI
Manager Function = 21, Reset based on Attr-0 -Bit 7 Alarm 4 LO

Reset Based on 13-Poll List, Attr-1 - Alarm Status 2
22..29= Reset based on Attr-0 - Alarm Status 1 bit 0..7

Manager Function = 22, Reset based on Attr-1 Bit 0 Alarm 5 HI
Manager Function = 23, Reset based on Attr-1 Bit 1 Alarm 5 LO
Manager Function = 24, Reset based on Attr-1 Bit 2 Alarm 6 HI
Manager Function = 25, Reset based on Attr-1 Bit 3 Alarm 6 LO
Manager Function = 26, Reset based on Attr-1 Bit 4 Alarm 7 HI
Manager Function = 27, Reset based on Attr-1 Bit 5 Alarm 7 LO
Manager Function = 28, Reset based on Attr-1 Bit 6 Spare
Manager Function = 29, Reset based on Attr-1 Bit 7 Spare

Application Example:

Process Instruction = Calculate reset based on Low Primary Airflow Alarm

Upper Count Threshold	= 15
Lower Count Threshold	= 5
Signal Low Limit	= 0
Signal High Limit	= 100
Initial Reset Signal Value	= 50
Add Increment	= 10
Drop Increment	= 7
Reverse Acting Option	= NO

There are 25 terminal unit controllers listed in the Poll List object. On the first 6 polls taken, 17 controllers have Low Zone Temperature Alarms. The reset signal is changed from 50 to 60 to 70 to 80 to 90 to 100, where it stays. A Logic object in conjunction with a Broadcast object could be configured to increase the Boiler object's supply temperature setpoint based on this very high reset signal.

Reset Based on Polling Status

Reset Based on 13-Poll List, Attr-2 - Polling Status
30..37=Reset based on Average Data in Attr-2 - Polling Status bit 0..7

Manager Function = 30, Reset based on Attr-2 Bit 0 of Polling Status
Manager Function = 31, Reset based on Attr-2 Bit 1 of Polling Status
Manager Function = 32, Reset based on Attr-2 Bit 2 of Polling Status
Manager Function = 33, Reset based on Attr-2 Bit 3 of Polling Status
Manager Function = 34, Reset based on Attr-2 Bit 4 Acknowledge
Manager Function = 35, Reset based on Attr-2 Bit 5 Communication Error
Manager Function = 36, Reset based on Attr-2 Bit 6 In Afterhours
Manager Function = 37, Reset based on Attr-2 Bit 7 Heat pump Request

Count Based on Alarms

Count Based on 13-Poll List, Attr-0 - Alarm Status 1
38..45= Count based on Attr-0 - Alarm Status 1 bit 0..7

Manager Function = 38, Count based on Attr-0 -Bit 0 Alarm 1 HI Zone Temp
Manager Function = 39, Count based on Attr-0 -Bit 1 Alarm 1 LO Zone Temp
Manager Function = 40, Count based on Attr-0 -Bit 2 Alarm 2 HI
Manager Function = 41, Count based on Attr-0 -Bit 3 Alarm 2 LO
Manager Function = 42, Count based on Attr-0 -Bit 4 Alarm 3 HI
Manager Function = 43, Count based on Attr-0 -Bit 5 Alarm 3 LO
Manager Function = 44, Count based on Attr-0 -Bit 6 Alarm 4 HI
Manager Function = 45, Count based on Attr-0 -Bit 7 Alarm 4 LO

Count Based on 13-Poll List, Attr-1 - Alarm Status 2
46..53= Count based on Attr-1 - Alarm Status 2 bit 0..7

Manager Function = 46, Count based on Attr-1 Bit 0 Alarm 5 HI
Manager Function = 47, Count based on Attr-1 Bit 1 Alarm 5 LO
Manager Function = 48, Count based on Attr-1 Bit 2 Alarm 6 HI
Manager Function = 49, Count based on Attr-1 Bit 3 Alarm 6 LO
Manager Function = 50, Count based on Attr-1 Bit 4 Alarm 7 HI
Manager Function = 51, Count based on Attr-1 Bit 5 Alarm 7 LO
Manager Function = 52, Count based on Attr-1 Bit 6 Spare
Manager Function = 53, Count based on Attr-1 Bit 7 Spare

Count Based on Polling Status

Count Based on 13-POLL LIST, Attr-2 - Polling Status
54..61= Count based on Average Data in Attr-2 - Polling Status bit 0..7

*Manager Function = 54, Count based on Attr-2 Bit 0 of Polling Status
*Manager Function = 55, Count based on Attr-2 Bit 1 of Polling Status
*Manager Function = 56, Count based on Attr-2 Bit 2 of Polling Status
*Manager Function = 57, Count based on Attr-2 Bit 3 of Polling Status
Manager Function = 58, Count based on Attr-2 Bit 4 Acknowledge
Manager Function = 59, Count based on Attr-2 Bit 5 Communication Error
Manager Function = 60, Count based on Attr-2 Bit 6 In Afterhours
Manager Function = 61, Count based on Attr-2 Bit 7 Heat pump Request

Calculations using Average Data

Reset Based on Average

Perform Reset on the Average Data (including 0 data) for specific Poll List Data
62..69= Reset on Average Data in Poll Data Byte 1..8

Perform Reset on the Average Data (excluding 0 data) for specific Data
78..85 = Average Data in Poll Data Byte 1..8

Min/Max Average Byte Value

Calculate Average of Data (including 0 data) for specific Data
70..77 = Average Data in Poll Data Byte 1..8

Calculate Average of Data (excluding 0 data) for specific Data
86..93 = Average Data in Poll Data Byte 1..8

This replaces102..109, and 118..125

Attr-0,LO Average Value (Int)

Attr-0,HI	Average Value (Fraction)
Attr-1,LO	Min Value-
Attr-1,HI	Max Value -
Attr-2,LO	Reset Value(LO Byte)
Attr-2,HI	Reset Value (HI Byte)
Attr-3,LO	Number of Values Used
Attr-3,HI	Dynamic Data 6 -

Calculations using Minimum Data

Perform Reset on the Minimum Data for specific Data
94..100 = Minimum Data in Poll Data Byte 1..8

Calculate Minimum Data for specific Data (Not used in FW740A..)
102..109 = Minimum Data in Poll Data Byte 1..8 (FW907A..)

Note: Redefined, Replaced by 86..93

Calculations using Maximum Data

Perform Reset Based on Maximum Data for specific Data
110..117 = Maximum Data in Poll Data Byte 1..8

Note: Redefined, Replaced by 86..93

Calculate Maximum Data for specific Data (Not used by FW740A..)
118..125 = Maximum Data in Poll Data Byte 1..8 (FW907A..)

Calculations using Selected Bits of Specific Data

Perform Reset Based on count of selected bits of specific Data

128..135 = Bits 0..7 in Poll Data Byte 1
136..143 = Bits 0..7 in Poll Data Byte 2
144..151 = Bits 0..7 in Poll Data Byte 3
152..159 = Bits 0..7 in Poll Data Byte 4
160..167 = Bits 0..7 in Poll DB5
168..175 = Bits 0..7 in Poll Data Byte 6
176..183 = Bits 0..7 in Poll Data Byte 7
184..191 = Bits 0..7 in Poll Data Byte 8

Calculate Count Based on count of selected bits for specific Data

192..199 = Bits 0..7 in Poll Data Byte 1
200..207 = Bits 0..7 in Poll Data Byte 2
208..215 = Bits 0..7 in Poll Data Byte 3
216..223 = Bits 0..7 in Poll Data Byte 4
224..231 = Bits 0..7 in Poll DB5
232..239 = Bits 0..7 in Poll Data Byte 6
240..247 = Bits 0..7 in Poll Data Byte 7
248..255 = Bits 0..7 in Poll Data Byte 8

Calculation using Word Values

Calculate Average Word Value
118..121 = Average Word Value in Poll Data Byte 1-2,3-4,5-6,7-8

Manager Function =118, Average Word Value in Poll Data Byte 1-2,
Manager Function =119, Average Word Value in Poll Data Byte 3-4,
Manager Function =120 Average Word Value in Poll DB5-6,
Manager Function =121, Average Word Value in Poll Data Byte 7-8

Attr-0	Function Value Average Word Value
Attr-1	LO WORD Total of Values
Attr-2	HI WORD Total of Values
Attr- 3 LO	Number of Values Used

Calculate Min/Max Word Value ***New! FW740A..***
122..125 Min/Max Word Value in Poll Data Byte 1-2,3-4,5-6,7-8

Manager Function =122, Min/Max Word Value in Poll Data Byte 1-2,
Manager Function =123, Min/Max Word Value in Poll Data Byte 3-4,
Manager Function =124, Min/Max Word Value in Poll DB5-6,
Manager Function =125, Min/Max Word Value in Poll Data Byte 7-8

Attr-0	Maximum Word Value
Attr-1	Minimum Word Values
Attr-2	
Attr- 3 LO	Number of Values Used
Attr- 3 HI	Spare

Poll Manager Glossary

Poll Manager Parameters

Poll Group X (Authority Code)

A Poll Manager index may be assigned up to 4 Poll Groups (Authority Codes). All Poll List indexes are assigned a single Poll Group. If the Poll Group for a given Poll List index matches one of the Poll Manager's Poll Groups, then this Poll List index is included in polls conducted by the Poll Manager index. User-changeable. MGR_AuthorityCode1 , …, MGR_AuthorityCode4 (17,X,7 and 8, LO BYTE and HI BYTE)

Control Count

An internal variable used to count the number of controllers meeting the manager function conditions. Used in reset calculation. Internal variable not available in the object.

Dynamic Data Byte X

These parameters are used to store data processed according to the Manager Function. The contents of these parameters depends on which Manager Function is chosen for this Poll Manager index. User-changeable. MGR_DynamicDataBYTE1 , …, MGR_DynamicDataBYTE8 (17,X,1..3, LO BYTE and HI BYTE)

Function Calculation Interval

Designates how often the Function Value is to be calculated. In seconds; user-changeable. MGR_FunctionCalcInterv (17,X,18,WORD)

Function Calculation Timer

Used to time Function Calculation Interval. In seconds; not user-changeable. MGR_FunctionCalcTimer (17,X,4,WORD)

Function Value

The dynamic result of the function calculation. Examined by other objects to effect resets of temperature setpoints, timed sequences, etc. Not User-changeable. MGR_FunctionValue (17,X,0,WORD)

Local Bus Assignment

The SINC/3 allows assigning the Poll Manager to Local 1 or Local 2 (17,X,5,HI bits23) 0 or 1 = Local 1, 2 = Local 2.

Manager Function

Designates the type of data accumulation and reset calculation to be performed on Poll List data obtained during a polling process. User-changeable. MGR_ManagerFunction (17,X,5,LO BYTE)

Poll Manager Index Enable

This must be set for the Manager Function and the Poll Instruction to be active MGR_IndexEnable.(17,X5,HIBIT1)

Poll Message Byte X

The message bytes used in the polling request message sent by this Polling Manager index. X is from 1 to 8. User-changeable; hexadecimal values. (17,X,10..13, LO BYTE and HI BYTE)

Poll Message Type

The ASI message type used in the polling request message sent by this Polling Manager index. Message type is always represented as a hexadecimal values. User-changeable; Byte. MGR_PollMessageType (17,X,9,HI BYTE)

Poll Request Body Size

The number of bytes in the body of the polling request message. Used to determine where the check sum will be placed. User-changeable. MGR_RequestBodySize (17,X,14,LO BYTE)

Poll Response Body Size

The number of bytes in the body of the polling response message. Used to determine where the check sum will be found. User-changeable. MGR_ResponseBodySize (17,X,14,HI BYTE)

Poll Scan Interval

The number of polling rounds between successive polls taken by this index of the Poll Manager. Each Poll Manager index should have a unique Scan Interval. Byte; User-changeable. MGR_PollrScanInterval (17,X,9,LO BYTE)

Polling Instruction

Designates how the date received from the polled controller will be saved in the poll list. User-changeable. MGR_PollingInstruction (17,X,6,LO_LS_NBL))

Relocate - Destination Byte Number

The byte number in the Poll List index's dynamic data block Poll Data Byte 1..8 where the first byte of relocated data is to be stored. Nibble; User-changeable; from 1 to 8. MGR_Relocate-DestByte (17,X,6,HI_MS_NBL)

Relocate - Number of Bytes

The number of bytes in a Poll List index's received data which are to be relocated in the dynamic data storage in the Poll List index. Nibble; User-changeable; integer from 1 to 8. MGR_Relocate-NumofByte (17,X,6,LO_LS_NBL)

Relocate - Source Byte Number

The first byte of the section of a Poll List index's received data which is to be relocated. Nibble; User-changeable; integer from 1 to 8. MGR_Relocate-SrcByte (17,X,6,HI_LS_NBL)

Reset - Add Increment

For direct acting reset, if the reset poll data is greater than Reset - Upper Threshold, then Reset - Add Increment is added to Function Value. User-changeable; Signed integer. MGR_Reset-AddIncr (17,X,16,WORD)

Reset - Drop Increment

For direct acting reset, if the reset poll data is less than Reset - Lower Threshold, then Reset - Drop Increment is subtracted from Function Value. User-changeable; Signed integer. MGR_Reset-DropIncr (17,X,16,WORD)

Reset - Lower Limit

Function Value in Reset calculations may not move below this limit. User-changeable; integer. MGR_Reset-LowerLimit (17,X,20,WORD)

Reset - Lower Threshold

For direct acting reset, if the Control Count is less than Reset - Lower Threshold, then Reset - Drop Increment is subtracted from Function Value. Pertains to the reset function. User-changeable; integer. MGR_Reset-LowerThresh (17,X,16,WORD)

Reset - Upper Limit

Function Value in Reset calculations may not move above this limit. User-changeable; integer. MGR_Reset-UpperLimit (17,X,20,WORD)

Reset - Upper Threshold

For direct acting reset, if the Control Count is greater than Reset - Upper Threshold, then Reset - Add Increment is added to Function Value User-changeable; integer. MGR_Reset-UpperThresh (17,X,16,WORD)

Reverse Acting Enable

If in reverse acting mode, then Reset - Add Increment is added to Function Value upon the reset data dropping below Reset - Lower Threshold, and Reset - Drop Increment is subtracted from Function Value upon the reset data rising above Reset - Upper Threshold. User-changeable; integer. MGR_ReverseActingEnabl (17,X,5,HI BIT 0)

Scan Count

An internal variable is created, Scan Count, is incremented at the end of each polling round.. Used to determine which poll manager should be active on a particular scan. Internal variable not available in the object.

Units For Dynamic Data

A code number which designates the units for the data contained in the Dynamic Data storage block. Not used for calculation. See the Input object definition for a definition of available units. Integer; user-changeable. MGR_UnitsForFunction (17,X,21,WORD)

Poll Manager Properties

The Poll Manager object defines the present values and setup parameters used to poll controllers on the local bus for specific alarm or other data, and to calculate a reset values, totals, averages, or other values based on the polled data.

This control block can be used for static pressure reset based on low airflow alarms, Hot duct reset based on the number of low zone alarms, or cold duct reset based on the number of high zone alarms. It can also be used to count the number of controllers in a certain mode or state, or with some specific alarm, or to compute the average, min, and max value for example of zone temperature.

POLL MANAGER (i,j)

Object Number	= 17
Data Type	= Word
Index	= 1 (0) or as allocated
Attributes	= 22 (0..21)
DYNAMIC Attributes	= 5 (0..4)
STATIC Attributes	= 17 (5..21)

Poll Manager Firmware Revision

ASIC/2-7540 FW754a Ver 2.2q Release 2007-06-08 PN70025-07 ECO-408
ASIC/2-8540 FW854a Ver 2.2q Release 2007-06-08 PN70027-05 ECO-409

- Fixes 17-MGR Manager Function Average Word Value when Average Word value is greater than 65535. Now computes average correctly and displays number of values used.

ASIC/2-7540 FW754a Ver 1.0b Released 2005-08-10 PN70025-01 ECO-390

- Local Bus polling at up to 19,200 baud.

ASIC/2-7040 FW740E Rev 2.7h Released 2005-01-14 CHK 0xD2F6 PN70002-16
ASIC/2-8040 FW840E Rev 2.7h Released 2005-01-18 CHK 0xAE98 PN70006-13

- Fixed problem with the poll manager clearing the poll list COM Error(bit 5)

SINC/3-3000 FW300B Rev 1.4 Released 04/26/2000 CHK 0x4F8F
ASIC/2-7040 FW740E Rev 1.5 Released 04/19/2000 CHK 0x15DB
ASIC/2-8040 FW840E Rev 1.5 Released 04/19/2000 CHK 0x14BF

- 17-Poll Manager Poll Group (Authority Code) 0, no longer valid Average Manager Function now shows remainder.

SINC/3-3000 FW300B Rev 1.3 Released 03/15/2000 CHK 0x625E

- Fixes Poll Manager Function to not depend on Local Bus Assignment

ASIC/2-7040 FW740C Rev 2.5 Released 07/08/99 CHK 0x6613
ASIC/2-8040 FW840C Rev 1.5 Released 07/08/99 CHK 0x66EB

- Tunes baud rate on 8040 Local Bus to poll & broadcast to ASIC/2
- Masks CommError Bits in Poll Instruction 12 for ZCOM

ASIC/2-7040 FW740C Rev 2.4 Released 06/09/99 CHK 0x68E1
ASIC/2-8040 FW840C Rev 1.4 Released 06/09/99 CHK 69B7h

- Adds pause in polling when other communication on the line is detected. Allows local bus communication with ASIC/1-8x55 on while polling.

ASIC/3-3000 FW300B Rev 1.0 Released 10/06/1999

Adds Local Bus Assignment

ASIC/2-7040 FW740C Rev 2.1 Released 08/20/98

Fixes problem with Poll Manager Calculation Timer

ASIC/2-7040 FW740C Rev 1.0 29 Jan 1997

Add Poll Instruction 12, ASIC/1-8x55 Polling Table 16
Fixed Min/Max Average.

ASIC/2-7040 FW740A Rev 1.0 (31 March 1994)

Local Bus Polling at up to 9600 baud
Added Polling Instruction 6, ASIC/2 Alarm Polling
Added Polling Instruction 11, ASIC/2 State Polling
Modified Manager Functions 62..69 and 78..88 to include Min/Max

Redefined Manager Functions 118..121 Average Word Value
Redefined Manager Functions 122..125 Min/Max Word Value

SC/1 FW907E Rev. 1.0, Released 3 Dec 1992

Local Bus Polling at 1200 baud
Added Poll Instruction 10 , Mode_State for ASIC/1-4300.
This properly changes State 1..4 to the standard
0..3, UNOCC/OCC/NSB/MRDY
Fixed Poll Manager to eliminate crazy polling.

Poll Manager DYNAMIC Properties

Attr-0 **Function Value** (signed)

This is the active function value based on the Manager Function that is performed each Function Calculation Interval.

Dynamic Data Byte

Attr-1 LO BYTE - **Dynamic Data Byte 1**

Used by Manager Function 1 for Zone Temperature Alarms,
Number of ASIC/1 in Low Zone Temp Alarm

Attr-1 HI BYTE - **Dynamic Data Byte 2**

Used by Manager Function 1 for Zone Temperature Alarms,
Number of ASIC/1 in High Zone Temp Alarm

Attr-2 LO BYTE - **Dynamic Data Byte 3**

Used by Manager Function 1 for Primary Air Alarms,
Number of ASIC/1 in Low Primary Air Alarm

Attr-2 HI BYTE - **Dynamic Data Byte 4**

Used by Manager Function 1 for Primary Air Alarms,
Number of ASIC/1 in High Primary Air Alarm

Attr-3 LO BYTE - **Dynamic DB5**

Used by Manager Function 1 for Afterhours Status,
Number of ASIC/1 in Afterhours Request.

Attr-3 HI BYTE - **Dynamic Data Byte 6**

Used by Manager Function 1 for Operate Request,
Number of ASIC/1-4300 requesting operation.

Attr-4 **Function Calculation Timer** (seconds)

Poll Manager STATIC Properties

Attr-5 Manager Setup

LO Byte - **Manager Function**

The Manager function defines the type of data accumulation or reset calculation to be performed by the poll manager. This determines the DYNAMIC values of this poll manger index. The manager function is performed at the end of the current polling cycle with the data that has just been collected using these polling instructions on data from all controllers with one of the 4 polling authorities indicated in this poll manager.

HI bit 0 - **Reversing Acting Enable**

0 = Direct Acting; 1 = Reverse Acting

HI bit 1 -**Poll Manager Index Enable**

HI bits23 - **Local Bus Assignment -(** FW300B..)

assigns Local Bus; 0 or 1 = Local 1, 2 = Local 2.

HI bit 4 - Spare
HI bit 5 - Spare
HI bit 6 - Spare
HI bit 7 - Spare

Attr-6 Poll Setup

The poll instruction defines the data request message and the polling instruction for unpacking the received data string and saving the data in the poll list ram values.

Note: that multiple poll manager indexes may use the same Poll Groups (Authority Codes) and write data to the same poll list. Make sure that they do not over-write one another's data.

LO_LS_NBL - **Polling Instruction**

0 = Inactive, No Polling
1 = ALR_8015, Alarm Polling ASIC/1-8010, ASIC/1-8015
2 = ALR_4300A, Alarm Polling ASIC/1-4300 (304A..)
3 = ALR_8205, Alarm Polling ASIC/1-8205
4 = ALR_4300D, Alarm Polling ASIC/1-4300 (304D..)
5 = ALR_7x10, Alarm Polling ASIC/1-7X10
6 = ALR_A2, Alarm Polling ASIC/2
7 = State_8015, Mode and State Polling ASIC/1-8010, ASIC/1-8015
8 = State_7x10, Mode and State Polling ASIC/1-7X10
9 = State_8205, Mode and State Polling ASIC/1-8205
10 = State_4300, Mode and State Polling ASIC/1-4300
11 = State_A2, State Polling ASIC/2
12 = Poll_8x55, ASIC/1-8x55 Table 16 Polling
13 = Inactive, No Polling
14 = Inactive, No Polling
15 = Place_Data, General Place Data

LO_MS_NBL - **Relocate - Number of Bytes**

The Number of Bytes to place
0 = No OP, 1..8 = Number of Bytes to place

HI_LS_NBL - **Relocate - Source Byte**

The number representing source of data (the starting byte) in the Poll Response message to be relocated to the Poll Data Bytes.
RS0 = 0 = Poll Response Body Byte 1.,
...,
RS15 = 15 = Response Body Data Byte 16

HI_MS_NBL - **Relocate - Destination Byte**

The number representing destination of data from the Poll Response message to be relocated to the Poll Data Bytes.
RD0 = 0 = Poll List, Attr-6, Poll Data Byte 1
...
RD7 = 7 = Poll List, Attr-13, Poll Data Byte 8

Poll Groups (Authority Codes)

Poll Group (Authority Codes) are used to select which addresses from the polling list to operate on with instructions from this poll manager. Up to 4 different Poll Group (Authority Codes) may be assigned to a poll manager. Note: Authority 0 does not poll. (In SC/1-9040 FW907A authority 0 would poll)

Attr-7 LO BYTE - **Poll Group 1**

Attr-7 HI BYTE - **Poll Group 2**

Attr-8 LO BYTE - **Poll Group 3**

Attr-8 HI BYTE - **Poll Group 4**

Poll Setup

Attr-9 Poll Setup

LO BYTE – **Poll Scan Interval**

Interval in terms of number of polling rounds that this poll manager should be active. Each Poll Manager should have a different scan interval.

HI BYTE - **Poll Message Type**

Attr-10 LO BYTE - **Poll Message Byte** 1
Attr-10 HI BYTE - **Poll Message Byte 2**
Attr-11 LO BYTE - **Poll Message Byte 3**
Attr-11 HI BYTE - **Poll Message Byte 4**
Attr-12 LO BYTE - **Poll Message Byte 5**
Attr-12 HI BYTE - **Poll Message Byte 6**

Attr-13 LO BYTE - **Poll Message Byte 7**
Attr-13 HI BYTE - **Poll Message Byte 8**

Attr-14 Message Size

LO BYTE - **Poll Request Body Size**
Request Message Body byte count M1, ..., Mn, not counting MT, AUTH, and CHK.

HI BYTE - **Poll Response Body Size**
Response message body byte count, M1, ..., Mn, not counting ACK and CHK.

Reset Parameters

Attr-15 Thresholds

LO BYTE **Reset - Lower Threshold**
In units of result of calculation.

HI BYTE **Reset - Upper Threshold**
In units of result of calculation.

Attr-16 **Reset - Add Increment**
The signed value to add to the present value at each calculation time when the upper threshold is exceeded. In units of result of calculation.

Attr-17 **Reset - Drop Increment**
The signed value to subtract from the present value at each calculation time when the upper threshold is exceeded. In units of result of calculation.

Attr-18 **Function Calculation Interval** (seconds)
The unsigned period to repeat the present value calculation in seconds.

Attr-19 **Reset - Upper Limit**
The maximum signed present value.

Attr-20 **Reset - Lower Limit**
The minimum signed present value.

Attr-21 Units

LO BYTE - **Units**
A number representing the units of calculation of the Poll Manager Function. It is not used by the firmware. It is reserved for use by the host to properly display reset, average, or other functional data.

HI BYTE - Spare