# Driver Manual
## (Supplement to the FieldServer Instruction Manual)

# FS-8704-49 Data Aire (DAP)

## APPLICABILITY & EFFECTIVITY

**Effective for all systems manufactured after May 1, 2001**

| | |
|---|---|
| Driver Version: | 1.07 |
| Document Revision: | 9 |

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## 1.      Data Aire Description

The Data Aire Driver is capable of direct connection to a network of Data Aire DAP devices. The FieldServer is connected in a RS-485 loop topology.  Two FieldServer ports are required per loop.  The driver is an active client.  All data is obtained by poll & response.

Connection to a DART is not supported by this driver.

The driver may be configured very simply (See Section 4.4).   A number of advanced configurations are also available and are described in Appendix B.   The driver supports the common message formats for common Data Aire DAP devices.   A list of the supported messages is provided in the manual.

The information that follows describes how to expand upon the factory defaults provided in the configuration files included with the FieldServer.

### 1.1.        Performance Issues - DARTIII only

Data Aire communication is based on a very low baud rate.  In addition inter-message timing constraints and overhead requirements for active messages in a Dart configuration add significant time to each transaction.  It is not possible to write a setpoint to a device until the device has been successfully read, and the result of the write will not be seen until the next read is complete.   The result of a write may not be seen for some time due to slow communications and significant inter poll delays.

### 1.2.        Data Alarm Network Module Network LED Operation

DAP-II units communicate with a DART unit by using a Data Alarm Network Module.  This module provides a RS-485 communications link.  Installed on the card are several LEDS. The table below explains how the LEDS appear under normal (correctly functioning) operation.

| LED | LED Appearance |
|-----|----------------|
| **FUSE** | The Network Module has a blown fuse detection circuit.  If one (or more) of the fuses has an open circuit, then the **FUSE** LED will be lit.  Normally, this LED is dark. |
| **DS1 & DS3** | Communications signals enter and leave the Network Module.  These LEDS reflect the communications activity. When first powered up, both LED's will be lit and the illumination will be steady.  As the DART communicates with the network, both LED's will begin to flicker in unison.  All of the Network Module LED's will flicker at the same time. |
| **NETWORK** | At some point the DART will send a communication message to a specific network-connected DAP-II that requires a reply to the DART.  If the message is received without error, the DAP-II will reply by engaging a relay on the Network Module and transmitting a message.  When this happens the **NETWORK** LED will come on.  Whenever a **NETWORK** LED is seen to come on it means that the communications into the Network Module is satisfactory. It is still possible to have a wiring problem downstream of the module that prevents the message from being received by the DART |

## 2.    Driver Scope of Supply

### 2.1.    Supplied by FieldServer Technologies for this driver

| FieldServer Technologies PART # | Description |
|---|---|
|  | RS-485 connection adapter |
| FS-8700-49 | Driver Manual. |

## 3.      Hardware Connections

The FieldServer is connected to the DAP devices as shown in connection drawing.

Configure the DAP devices according to manufacturer's instructions
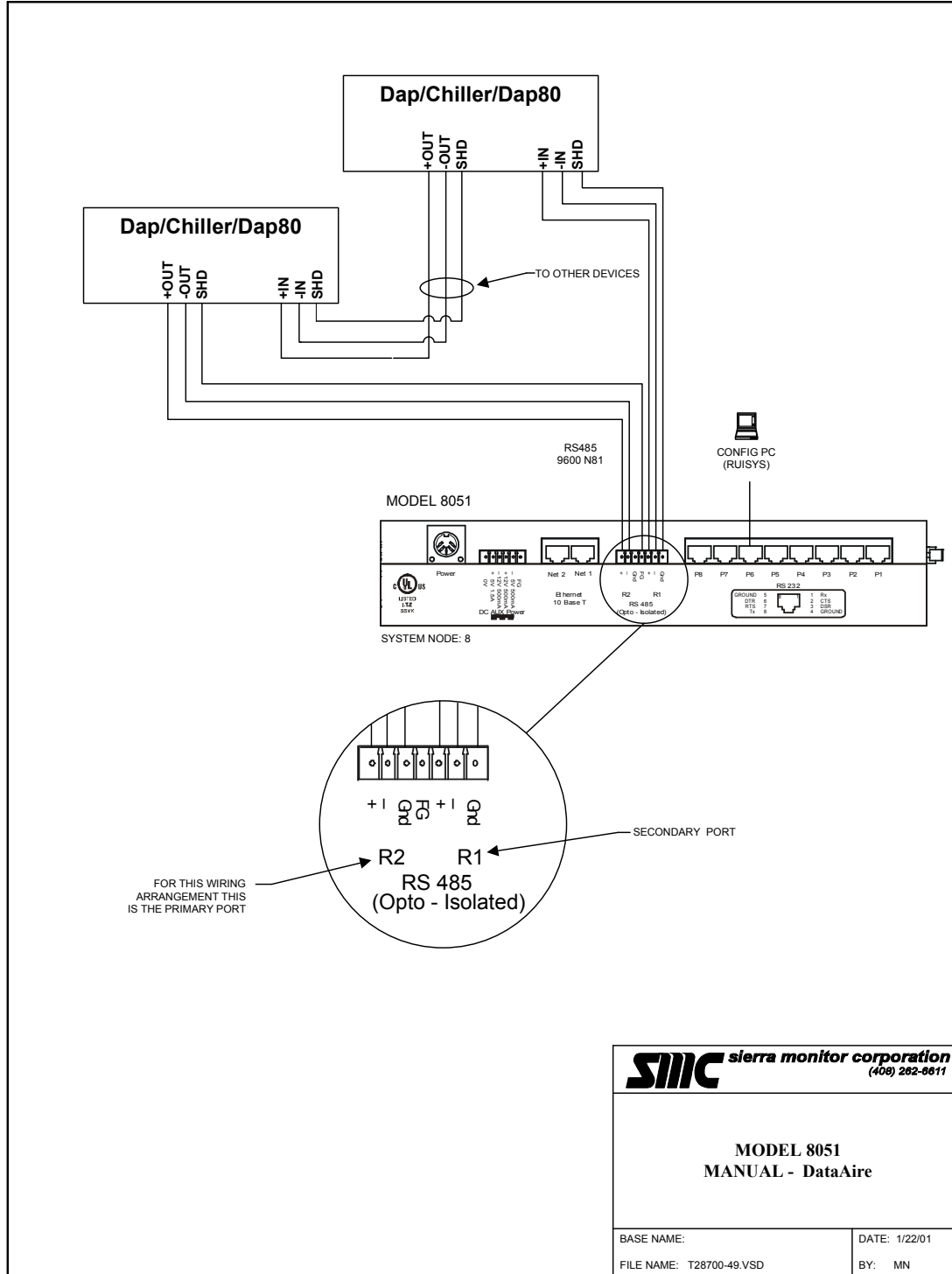
## 4.      Configuring the FieldServer as a Data Aire Client

For a detailed discussion on FieldServer configuration, please refer to the FieldServer instruction manual.  The information that follows describes how to expand upon the factory defaults provided in the configuration files included with the FieldServer (See ".csv" sample files provided with the FieldServer).

This section documents and describes the parameters necessary for configuring the FieldServer to communicate with a Data Aire Server

### 4.1.      Data Arrays/Descriptors

The configuration file tells the FieldServer about its interfaces, and the routing of data required.  In order to enable the FieldServer for Data Aire communications, the driver independent FieldServer buffers need to be declared in the "Data Arrays" section, the destination device addresses need to be declared in the "Client Side Nodes" section, and the data required from the servers needs to be mapped in the "Client Side Map Descriptors" section. Details on how to do this can be found below.

Note that in the tables, * indicates an optional parameter, with the bold legal value being the default.

| Section Title | | |
|---|---|---|
| Data_Arrays | | |
| **Column Title** | **Function** | **Legal Values** |
| Data_Array_Name | Provide name for Data Array | Up to 15 alphanumeric characters |
| Data_Array_Format | Provide data format. Each Data Array can only take on one format. | Float, Bit, UInt16, SInt16, Packed_Bit, Byte, Packed_Byte, Swapped_Byte |
| Data_Array_Length | Number of Data Objects. Must be larger than the data storage area required by the Map Descriptors for the data being placed in this array. | 1-10,000 |

**Example**

| // Data Arrays | | |
|---|---|---|
| Data_Arrays | | |
| Data_Array_Name, | Data_Format, | Data_Array_Length, |
| DA_AI_01, | UInt16, | 200 |
| DA_AO_01, | UInt16, | 200 |
| DA_DI_01, | Bit, | 200 |
| DA_DO_01, | Bit, | 200 |

### 4.2. Client Side Connection Descriptions

| Connections | | |
|---|---|---|
| **Column Title** | **Function** | **Legal Values** |
| Port | This is the FieldServer port connected to the DART's RS-232 port. | P1-P8, R1-R2[1] (P1-P8) requires 232/485 converter. |
| Secondary_Port* | The return loop from the DAP devices is connected to this port. (Loop connected to Tx+ & Tx- terminals. | P1-P8, R1-R2[1] (R1-R2) requires 232/485 converter. |
| Baud* | Specify baud rate | 2400/9600[2]  (Vendor Limitation) |
| Parity* | Specify parity | **None** |
| Data_Bits* | Specify data bits | **8** |
| Stop_Bits* | Specify stop bits | **1** |
| Protocol | Specify protocol used.  Either keyword may be used. | DAP, Daire |
| Handshaking* | Specify hardware handshaking | **None** |
| Poll Delay* | Time between internal polls | 0-32000s, **1s** |

**Example**

```
//      Client Side Connections

Connections
Port,   Secondary Port,   Protocol,   Baud,   Parity,   Data_Bits,   Stop_Bits,   Poll_Delay
R1,     R2,               DAP,        2400,   None,     8,           1,           0.100s
```

Use this port identifier in the client side node configuration described in Section 4.3.

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[1] Not all ports shown are necessarily supported by the hardware. Consult the appropriate Instruction manual for details of the ports available on specific hardware.
[2] DAP V9.5 or later supports 9600

### 4.3. Client Side Node Descriptors

| Section Title |
| --- |
| Nodes |

| Column Title | Function | Legal Values |
| --- | --- | --- |
| Node_Name | Provide name for node | Up to 32 alphanumeric characters |
| Node_ID | Modbus station address of physical server node | 1-259 |
| Protocol | Specify protocol used | DAP |
| Connection | Specify which port the device is connected to the FieldServer | P1-P8, R1-R2[3] |

**Example**

```
//   Client Side Nodes

Nodes
Node_Name              Node_ID              Protocol            Connection
Unit1,                 1,                   DAP,                R1
```

This is the connection to the primary port identified with the 'Port' keyword in the connection configuration described in Section 4.2

### 4.4. Client Side Map Descriptors

#### 4.4.1. FieldServer Related Map Descriptor Parameters

| Column Title | Function | Legal Values |
| --- | --- | --- |
| Map_Descriptor_Name | Name of this Map Descriptor | Up to 32 alphanumeric characters |
| Data_Array_Name | Name of Data Array where data is to be stored in the FieldServer | One of the Data Array names from "Data Array" section above |
| Data_Array_Offset | Starting location in Data Array | 0 to maximum specified in "Data Array" section above |
| Function | Function of Client Map Descriptor | RDBC, WRBC, WRBX |

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[3] Not all ports shown are necessarily supported by the hardware. Consult the appropriate Instruction manual for details of the ports available on specific hardware.

### 4.4.2.        Driver Related Map Descriptor Parameters

| Column Title | Function | Legal Values |
|---|---|---|
| Node_Name | Name of Node to fetch data from | One of the node names specified in "Client Node Descriptor" above |
| Data_Type | Data type | Register, Coil, AI, DI |
| Length | Length of Map Descriptor | 1 |
| Address | Starting address of read block | Not required for client configuration - used in simulation configuration only. |
| DA_Func* | Only required when the function is a Read (rdbc). Tells the driver to poll the device for all the data that is available. The data is device specific. Other uses of this parameter are discussed in Appendix B . | Everything – See Appendix A |
| DA_Field | Required when the function is a write (wrbc) or when the Map Descriptor is associated with a write by means of the DA_Assoc parameter value. This is the name of the data field whose value you wish to set in the device. Other uses of this parameter are discussed in Appendix B. | See Appendix A.2 for a list of permitted values. |
| DA_Assoc | Use to associate passive Map Descriptors with an active Map Descriptor. Multiple fields can be associated with one WRBC Map Descriptor, thus writing multiple values to one device using just one message. | Any positive integer.  See Appendix E |

### 4.4.3.        Timing Parameters

| Column Title | Function | Legal Values |
|---|---|---|
| Scan_Interval | Rate at which data is polled | ≥0.1s |

#### 4.4.4. Map Descriptor Example 1 - Everything

The FieldServer listens passively for all possible data from the device called 'unit1' and stores the data in an array called 'DA_01'. The data that is obtained from 'unit1' is dependent on the type of device. Irrespective of the device type the arrangement of data, stored in DA_01, is fixed. If a data field cannot be obtained from 'unit1' then the array is left with a zero value for that data field.

```
//  Client Side Map Descriptors

Map Descriptors
Map_Descriptor_Name,   Data_Array_Name,   Data_Array_Offset,   Function,   Node_Name,   Address,   Length,   DA_Func,      Scan_Interval
Read_Node_01,          DA_01,             0,                   RDBC,       Unit1,       0,         1300,     Everything,   2.5s
```

It is recommended that the format of the Data Array be FLOAT as the data read from the unit consists of bits, bytes and real numbers.

The node name connects the Map Descriptor to a node definition which in turn is connected to a port.

Always set the Address to zero and the length to 1300 as this is the max number of data points that can be read

Tells the driver that this Map Descriptor is used to (poll &) store a complete data set from the unit.

The scan interval is used to control the minimum time between poll messages. It may take several polls / messages to obtain a complete data set (the number is dependent on the unit type.)

#### 4.4.5. Map Descriptor: Example 2 – Writing a Set-Point.

```
//  Client Side Map Descriptors

Map Descriptors
Map_Descriptor_Name,   Data_Array_Name,   Data_Array_Offset,   Function,   Node_Name,   Address   Length,   DA_Field,       Scan_Interval
Write_SP_01,           DA_SETPOINTS,      0,                   WRBC,       Unit1,       0,        1,        nom_h_setpt,    20s
```

The setpoint is obtained from this Data Array.

Always leave the address set to zero and the length as one.

Select the data field from Appendix B.3. Ensure that the keyword can be written to the unit type identified as unit1.

Example. If unit1 is a Chiller then the above Map Descriptor will not function correctly as it can only be used to write to unit types 7,9,14,15.

This is how often the data will be written to the device. Reduce the scan interval when using a dart. The dart will only take control of the devices when the network has been idle for at least 50 seconds. If polls are generated too often, the dart will never exercise control.

### 4.4.6. Map Descriptor: Example 3 – Writing multiple points using one message.

*Additional information is provided in Appendix B*

```
//  Client Side Map Descriptors

Map Descriptors
Map_Descriptor_Name,    Data_Array_Name,   Data_Array_Offset,   Function,   Node_name,   Address,   Length,   DA_Field,        DA_Assoc,   Scan_Interval
Write_Map_Descriptor_1,  DA_SETPOINTS,     0,                   WRBC,       Unit1,       0,         1,         nom_h_setpt,     2,          120s
Write_Map_Descriptor_1,  DA_SETPOINTS,     1,                   passive,    Unit1,       0,         1,         t_setpt,         2,
```

A 'Write' and a passive to the same node. This write will update two fields, the nom_h_setpt and the t_setpt. The write Map Descriptor. must precede the passive. For a Dart, use wrbx instead of wrbc.

Associate the passive Map Descriptor to the active (wrbc) Map Descriptor. In this way the driver will use only one message to write to the device. The message will be built using both Map Descriptors. This method reduces the communication load.

The association is made using the DA_Assoc parameter. Use unique positive integers. Omitting the DA_Assoc parameter when using 'passive' Map Descriptors will produce ambiguous results.

## Appendix A. Data Tables

### *Appendix A.1.  Data Table 1: Array Locations of 'Everything'*

In the following table the array location indicates the offset in the Data Array at which a data field can be found.  (This offset is relative to the offset specified in the Map Descriptor) The columns headed 2, 3 … indicate the unit types for which the data fields are available. For example: The field 'd_temp' can be read from unit types 2, 5,6,7,9 but not from any of the other unit types. It is beyond the scope of this manual to describe each field and to indicate valid ranges. Such information should be obtained from the Data Aire Corporation.

'x' Indicates Read only
'X' Indicates a point that can be read & written.
'w' Indicates a write only point.

| Array Location | Method | Num Elements | Data Field | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 14 | 15 | Message Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | Zone | | w | w | w | w | w | w | w | w | w | Dap-Config |
| 2 | 1 | 1 | Inhibit | | w | w | w | w | w | w | w | w | w | Dap-Config |
| 3 | 4 | 1 | unitType | x | x | x | x | x | x | x | x | x | x | Dap-Unit |
| 4 | 2 | 1 | temp | x | | | x | x | x | | x | | | Dap-Stat |
| 5 | 2 | 1 | hum | x | | | x | x | x | | x | | | Dap-Stat |
| 6 | 2 | 1 | d_temp | x | | | x | x | x | | x | | | Dap-Stat |
| 7 | 3 | 8 | mode | x | | | x | x | x | | x | | | Dap-Stat |
| 23 | 3 | 8 | hold | x | | | x | x | x | | x | | | Dap-Stat |
| 39 | 1 | 1 | cs_on | x | | | x | x | x | | x | | | Dap-Stat |
| 40 | 1 | 1 | hs_on | x | | | x | x | x | | x | | | Dap-Stat |
| 41 | 1 | 1 | valvePCT | x | | | x | x | x | | x | | | Dap-Stat |
| 42 | 1 | 1 | hVlvPCT | x | | | x | x | x | | x | | | Dap-Stat |
| 43 | 4 | 14 | Errors - see Appendix E.4 for more information | x | | | x | x | x | | x | | | Dap-Stat |
| 57 | 2 | 1 | hiTemp | x | | | x | x | x | | x | | | Dap-Stat |
| 58 | 2 | 1 | loTemp | x | | | x | x | x | | x | | | Dap-Stat |
| 59 | 2 | 1 | hiHum | x | | | x | x | x | | x | | | Dap-Stat |
| 60 | 2 | 1 | loHum | x | | | x | x | x | | x | | | Dap-Stat |
| 61 | 1 | 1 | chilled_water | x | | | x | x | x | | x | | | Dap-Stat |
| 62 | 1 | 1 | compressor_config | x | | | x | x | x | | x | | | Dap-Stat |
| 63 | 1 | 1 | heat_strip_config | x | | | x | x | x | | x | | | Dap-Stat |
| 64 | 1 | 1 | hum_config | x | | | x | x | x | | x | | | Dap-Stat |
| 65 | 1 | 1 | csUtilPct | x | | | x | x | x | | x | | | Dap-Stat |
| 66 | 1 | 1 | hsUtilPct | x | | | x | x | x | | x | | | Dap-Stat |
| 67 | 1 | 1 | valveUtilPct | x | | | x | x | x | | x | | | Dap-Stat |
| 68 | 1 | 1 | humUtilPCT | x | | | x | x | x | | x | | | Dap-Stat |
| 69 | 1 | 1 | alrm_select_1 | x | | | x | x | x | | x | | | Dap-Stat |
| 70 | 1 | 1 | alrm_select_2 | x | | | x | x | x | | x | | | Dap-Stat |
| 71 | 1 | 1 | alrm_select_3 | x | | | x | x | x | | x | | | Dap-Stat |
| 72 | 1 | 1 | alrm_select_4 | x | | | x | x | x | | x | | | Dap-Stat |

| Array Location | Method | Num Elements | Data Field | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 14 | 15 | Message Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73 | 3 | 56 | bitErrors - see Appendix E.4 for more information | x | | | x | x | x | | x | | | Dap-Stat |
| 185 | 1 | 1 | runtime_c1 | x | | | x | x | x | | x | | | Dap-Xtra |
| 186 | 1 | 1 | runtime_c2 | x | | | x | x | x | | x | | | Dap-Xtra |
| 187 | 1 | 1 | runtime_c3 | x | | | x | x | x | | x | | | Dap-Xtra |
| 188 | 1 | 1 | runtime_c4 | x | | | x | x | x | | x | | | Dap-Xtra |
| 189 | 1 | 1 | runtime_ht1 | x | | | x | x | x | | x | | | Dap-Xtra |
| 190 | 1 | 1 | runtime_ht2 | x | | | x | x | x | | x | | | Dap-Xtra |
| 191 | 1 | 1 | runtime_ht3 | x | | | x | x | x | | x | | | Dap-Xtra |
| 192 | 1 | 1 | runtime_hum | x | | | x | x | x | | x | | | Dap-Xtra |
| 193 | 1 | 1 | runtime_evap | x | | | x | x | x | | x | | | Dap-Xtra |
| 194 | 1 | 1 | runtime_cond | x | | | x | x | x | | x | | | Dap-Xtra |
| 195 | 1 | 1 | runtime_dehum | x | | | x | x | x | | x | | | Dap-Xtra |
| 196 | 1 | 1 | runtime_esc | x | | | x | x | x | | x | | | Dap-Xtra |
| 197 | 1 | 1 | runtime_cwc | x | | | x | x | x | | x | | | Dap-Xtra |
| 198 | 4 | 20 | errors | x | | | x | x | x | | x | | | Dap-Xtra |
| 218 | 6 | 10 | errage | x | | | x | x | x | | x | | | Dap-Xtra |
| 258 | 1 | 1 | version | x | | | x | x | x | | x | | | Dap-Xtra |
| 259 | 2 | 1 | tmbmair | x | | | x | x | x | | x | | | Dap-Xtra |
| 260 | 2 | 1 | tmbhum | x | | | x | x | x | | x | | | Dap-Xtra |
| 261 | 1 | 1 | tmbairdb | x | | | x | x | x | | x | | | Dap-Xtra |
| 262 | 6 | 13 | runtimes (as array) | x | | | x | x | x | | x | | | Dap-Xtra |
| 314 | 3 | 80 | bitErrors | x | | | x | x | x | | x | | | Dap-Xtra |
| 474 | 4 | 1 | adj_rate | X | | | X | X | | | | | | Dap-Menu |
| 478 | 1 | 1 | alrm_delay_1 | X | | | X | X | | | | | | Dap-Menu |
| 479 | 1 | 1 | alrm_delay_2 | X | | | X | X | | | | | | Dap-Menu |
| 480 | 1 | 1 | alrm_delay_3 | X | | | X | X | | | | | | Dap-Menu |
| 481 | 4 | 1 | alrm_enable_1 | X | | | X | X | | | | | | Dap-Menu |
| 482 | 4 | 1 | alrm_enable_2 | X | | | X | X | | | | | | Dap-Menu |
| 483 | 4 | 1 | alrm_enable_3 | X | | | X | X | | | | | | Dap-Menu |
| 484 | 4 | 1 | alrm_select_1 | X | | | X | X | | | | | | Dap-Menu |
| 485 | 4 | 1 | alrm_select_2 | X | | | X | X | | | | | | Dap-Menu |
| 486 | 4 | 1 | alrm_select_3 | X | | | X | X | | | | | | Dap-Menu |
| 487 | 1 | 1 | chilled_water | X | | | X | X | | | | | | Dap-Menu |
| 488 | 1 | 1 | compressor_config | X | | | X | X | | | | | | Dap-Menu |
| 489 | 1 | 1 | c_mode | X | | | X | X | | | | | | Dap-Menu |
| 490 | 2 | 1 | fire_lim | X | | | X | X | | | | | | Dap-Menu |
| 491 | 1 | 1 | heat_strip_config | X | | | X | X | | | | | | Dap-Menu |
| 492 | 1 | 1 | hi_cal | X | | | X | X | | | | | | Dap-Menu |
| 493 | 1 | 1 | hi_h_cal | X | | | X | X | | | | | | Dap-Menu |
| 494 | 2 | 1 | hi_t_lim | X | | | X | X | | | | | | Dap-Menu |
| 495 | 1 | 1 | humid_config | X | | | X | X | | | | | | Dap-Menu |
| 496 | 1 | 1 | h_calib | X | | | X | X | | | | | | Dap-Menu |
| 497 | 1 | 1 | lead_lag | X | | | X | X | | | | | | Dap-Menu |

| Array Location | Method | Num Elements | Data Field | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 14 | 15 | Message Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 498 | 1 | 1 | loc_h_deadband | X | | | X | X | | | | | | Dap-Menu |
| 499 | 1 | 1 | loc_h_setpt | X | | | X | X | | | | | | Dap-Menu |
| 500 | 2 | 1 | loc_t_dband | X | | | X | X | | | | | | Dap-Menu |
| 501 | 2 | 1 | loc_t_setpt | X | | | X | X | | | | | | Dap-Menu |
| 502 | 1 | 1 | lo_cal | X | | | X | X | | | | | | Dap-Menu |
| 503 | 1 | 1 | lo_h_lim | X | | | X | X | | | | | | Dap-Menu |
| 504 | 2 | 1 | lo_t_lim | X | | | X | X | | | | | | Dap-Menu |
| 505 | 1 | 1 | main_int | X | | | X | X | | | | | | Dap-Menu |
| 506 | 1 | 1 | passwd_a | X | | | X | X | | | | | | Dap-Menu |
| 507 | 1 | 1 | passwd_b | X | | | X | X | | | | | | Dap-Menu |
| 508 | 1 | 1 | rst_mode | X | | | X | X | | | | | | Dap-Menu |
| 509 | 1 | 1 | s_delay | X | | | X | X | | | | | | Dap-Menu |
| 510 | 2 | 1 | t_calib | X | | | X | X | | | | | | Dap-Menu |
| 511 | 1 | 1 | voice | X | | | X | X | | | | | | Dap-Menu |
| 512 | 1 | 1 | vvrg | X | | | X | X | | | | | | Dap-Menu |
| 513 | 1 | 1 | cat1 | X | | | X | X | | | | | | Dap-Menu |
| 514 | 1 | 1 | cat2 | X | | | X | X | | | | | | Dap-Menu |
| 515 | 1 | 1 | cat3 | X | | | X | X | | | | | | Dap-Menu |
| 516 | 2 | 1 | d_calib | X | | | X | X | | | | | | Dap-Menu |
| 517 | 2 | 1 | lo_d_lim | X | | | X | X | | | | | | Dap-Menu |
| 518 | 1 | 1 | ptc | X | | | X | X | | | | | | Dap-Menu |
| 519 | 2 | 1 | supplyT | | x | x | | | | x | | | | Chiller-Stat |
| 520 | 2 | 1 | returnT | | x | x | | | | x | | | | Chiller-Stat |
| 521 | 4 | 1 | coolOn1 | | x | x | | | | x | | | | Chiller-Stat |
| 522 | 4 | 2 | coolOn2 | | x | x | | | | x | | | | Chiller-Stat |
| 523 | 4 | 2 | coolOn3 | | x | x | | | | x | | | | Chiller-Stat |
| 524 | 2 | 1 | valvePct | | x | x | | | | x | | | | Chiller-Stat |
| 525 | 4 | 1 | pumpsOn | | x | x | | | | x | | | | Chiller-Stat |
| 526 | 4 | 1 | condOn | | x | x | | | | x | | | | Chiller-Stat |
| 527 | 4 | 1 | modFail | | x | x | | | | x | | | | Chiller-Stat |
| 528 | 2 | 1 | hiSupT | | x | x | | | | x | | | | Chiller-Stat |
| 529 | 2 | 1 | loSupT | | x | x | | | | x | | | | Chiller-Stat |
| 530 | 2 | 1 | hiRetT | | x | x | | | | x | | | | Chiller-Stat |
| 531 | 2 | 1 | loRetT | | x | x | | | | x | | | | Chiller-Stat |
| 532 | 1 | 1 | csUtilPct1 | | x | x | | | | x | | | | Chiller-Stat |
| 533 | 1 | 1 | csUtilPct2 | | x | x | | | | x | | | | Chiller-Stat |
| 534 | 1 | 1 | csUtilPct3 | | x | x | | | | x | | | | Chiller-Stat |
| 535 | 1 | 1 | valveUtilPct | | x | x | | | | x | | | | Chiller-Stat |
| 536 | 3 | 48 | Errors - see Appendix E.4 for more information | | x | x | | | | x | | | | Chiller-Stat |
| 584 | 1 | 1 | mode | | x | x | | | | x | | | | Chiller-Stat |
| 585 | 6 | 11 | runtimes | | x | x | | | | x | | | | Chiller-Xtra |
| 596 | 3 | 80 | errold | | x | x | | | | x | | | | Chiller-Xtra |
| 676 | 6 | 10 | errage | | x | x | | | | x | | | | Chiller-Xtra |

| Array Location | Method | Num Elements | Data Field | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 14 | 15 | Message Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 854 | 4 | 1 | adjust_rate | x | x | | | | | x | | | | Chiller-Menu |
| 855 | 4 | 1 | auto_ack | X | X | | | | | X | | | | Chiller-Menu |
| 856 | 2 | 1 | aux_setpt | X | X | | | | | X | | | | Chiller-Menu |
| 857 | 4 | 1 | backup_mods | X | X | | | | | X | | | | Chiller-Menu |
| 858 | 2 | 1 | backup_setpt | X | X | | | | | X | | | | Chiller-Menu |
| 859 | 4 | 1 | cmota | X | X | | | | | X | | | | Chiller-Menu |
| 860 | 4 | 1 | comp_type | X | X | | | | | X | | | | Chiller-Menu |
| 861 | 4 | 1 | ptc | X | X | | | | | X | | | | Chiller-Menu |
| 862 | 2 | 1 | hi_r_lim | X | X | | | | | X | | | | Chiller-Menu |
| 863 | 2 | 1 | hi_s_lim | X | X | | | | | X | | | | Chiller-Menu |
| 864 | 4 | 1 | LL_policy | X | X | | | | | X | | | | Chiller-Menu |
| 865 | 2 | 1 | lo_r_lim | X | X | | | | | X | | | | Chiller-Menu |
| 866 | 2 | 1 | lo_s_lim | X | X | | | | | X | | | | Chiller-Menu |
| 867 | 1 | 1 | main_int | X | X | | | | | X | | | | Chiller-Menu |
| 868 | 4 | 1 | mods_configd | X | X | | | | | X | | | | Chiller-Menu |
| 869 | 1 | 1 | network_ID | X | X | | | | | X | | | | Chiller-Menu |
| 870 | 1 | 1 | op_1_delay | X | X | | | | | X | | | | Chiller-Menu |
| 871 | 1 | 1 | op_2_delay | X | X | | | | | X | | | | Chiller-Menu |
| 872 | 4 | 1 | op_1_message | X | X | | | | | X | | | | Chiller-Menu |
| 873 | 4 | 1 | op_2_message | X | X | | | | | X | | | | Chiller-Menu |
| 874 | 1 | 1 | password | X | X | | | | | X | | | | Chiller-Menu |
| 875 | 4 | 4 | relay_mask_0 | X | X | | | | | X | | | | Chiller-Menu |
| 879 | 4 | 4 | relay_mask_1 | X | X | | | | | X | | | | Chiller-Menu |
| 883 | 4 | 4 | relay_mask_2 | X | X | | | | | X | | | | Chiller-Menu |
| 887 | 4 | 1 | restart_mode | X | X | | | | | X | | | | Chiller-Menu |
| 888 | 4 | 1 | reverse_valve | X | X | | | | | X | | | | Chiller-Menu |
| 889 | 4 | 1 | sc_alarm_on | X | X | | | | | X | | | | Chiller-Menu |
| 890 | 1 | 1 | start_delay | X | X | | | | | X | | | | Chiller-Menu |
| 891 | 1 | 1 | supply_dband | X | X | | | | | X | | | | Chiller-Menu |
| 892 | 2 | 1 | supply_setpt | X | X | | | | | X | | | | Chiller-Menu |
| 893 | 4 | 1 | temp_scale | X | X | | | | | X | | | | Chiller-Menu |
| 894 | 4 | 1 | valve_voltage | X | X | | | | | X | | | | Chiller-Menu |
| 895 | 4 | 1 | voice | X | X | | | | | X | | | | Chiller-Menu |
| 896 | 4 | 1 | water_valve | X | X | | | | | X | | | | Chiller-Menu |
| 897 | 1 | 1 | return_cal | X | X | | | | | X | | | | Chiller-Menu |
| 898 | 1 | 1 | supply_cal | X | X | | | | | X | | | | Chiller-Menu |
| 899 | 4 | 1 | adj_rate | | | | | | X | | X | X | X | Dap80-Menu |
| 900 | 1 | 1 | alrm_delay_1 | | | | | | X | | X | X | X | Dap80-Menu |
| 901 | 1 | 1 | alrm_delay_2 | | | | | | X | | X | X | X | Dap80-Menu |
| 902 | 1 | 1 | alrm_delay_3 | | | | | | X | | X | X | X | Dap80-Menu |
| 903 | 1 | 1 | alrm_delay_4 | | | | | | X | | X | X | X | Dap80-Menu |
| 904 | 4 | 1 | alrm_select_1 | | | | | | X | | X | X | X | Dap80-Menu |
| 905 | 4 | 1 | alrm_select_2 | | | | | | X | | X | X | X | Dap80-Menu |
| 906 | 4 | 1 | alrm_select_3 | | | | | | X | | X | X | X | Dap80-Menu |

| Array Location | Method | Num Elements | Data Field | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 14 | 15 | Message Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 907 | 4 | 1 | alrm_select_4 | | | | | | X | | X | X | X | Dap80-Menu |
| 908 | 4 | 1 | ant-enable | | | | | | X | | X | X | X | Dap80-Menu |
| 909 | 4 | 1 | autoflush_time | | | | | | X | | X | X | X | Dap80-Menu |
| 910 | 4 | 1 | auto_ack | | | | | | X | | X | X | X | Dap80-Menu |
| 911 | 4 | 1 | comp_config | | | | | | X | | X | X | X | Dap80-Menu |
| 912 | 4 | 1 | control_type | | | | | | X | | X | X | X | Dap80-Menu |
| 913 | 4 | 1 | c_mode | | | | | | X | | X | X | X | Dap80-Menu |
| 914 | 4 | 1 | da_volts | | | | | | X | | X | X | X | Dap80-Menu |
| 915 | 4 | 1 | dehum_on | | | | | | X | | X | X | X | Dap80-Menu |
| 916 | 2 | 1 | d_calib | | | | | | X | | X | X | X | Dap80-Menu |
| 917 | 4 | 1 | esaver_supp_comp | | | | | | X | | X | X | X | Dap80-Menu |
| 918 | 2 | 1 | fire_lim | | | | | | X | | X | X | X | Dap80-Menu |
| 919 | 4 | 1 | heater_config | | | | | | X | | X | X | X | Dap80-Menu |
| 920 | 2 | 1 | hi_h_lim | | | | | | X | | X | X | X | Dap80-Menu |
| 921 | 2 | 1 | hi_t_lim | | | | | | X | | X | X | X | Dap80-Menu |
| 922 | 4 | 1 | humid_config | | | | | | X | | X | X | X | Dap80-Menu |
| 923 | 2 | 1 | h_calib | | | | | | X | | X | X | X | Dap80-Menu |
| 924 | 1 | 1 | h_dband | | | | | | X | | X | X | X | Dap80-Menu |
| 925 | 4 | 1 | lead_lag | | | | | | X | | X | X | X | Dap80-Menu |
| 926 | 2 | 1 | lo_d_lim | | | | | | X | | X | X | X | Dap80-Menu |
| 927 | 2 | 1 | lo_h_lim | | | | | | X | | X | X | X | Dap80-Menu |
| 928 | 2 | 1 | lo_t_lim | | | | | | X | | X | X | X | Dap80-Menu |
| 929 | 2 | 1 | main_int | | | | | | X | | X | X | X | Dap80-Menu |
| 930 | 1 | 1 | network_id | | | | | | X | | X | X | X | Dap80-Menu |
| 931 | 2 | 1 | nom_h_setpt | | | | | | X | | X | X | X | Dap80-Menu |
| 932 | 1 | 1 | password | | | | | | X | | X | X | X | Dap80-Menu |
| 933 | 4 | 1 | ptc | | | | | | X | | X | X | X | Dap80-Menu |
| 934 | 3 | 16 | relay_1_mask_0 | | | | | | X | | X | X | X | Dap80-Menu |
| 950 | 3 | 16 | relay_1_mask_1 | | | | | | X | | X | X | X | Dap80-Menu |
| 966 | 3 | 16 | relay_1_mask_2 | | | | | | X | | X | X | X | Dap80-Menu |
| 982 | 3 | 16 | relay_2_mask_0 | | | | | | X | | X | X | X | Dap80-Menu |
| 998 | 3 | 16 | relay_2_mask_1 | | | | | | X | | X | X | X | Dap80-Menu |
| 1014 | 3 | 16 | relay_2_mask_2 | | | | | | X | | X | X | X | Dap80-Menu |
| 1030 | 3 | 16 | relay_3_mask_0 | | | | | | X | | X | X | X | Dap80-Menu |
| 1046 | 3 | 16 | relay_3_mask_1 | | | | | | X | | X | X | X | Dap80-Menu |
| 1062 | 3 | 16 | relay_3_mask_2 | | | | | | X | | X | X | X | Dap80-Menu |
| 1078 | 4 | 1 | reverse_valve | | | | | | X | | X | X | X | Dap80-Menu |
| 1079 | 4 | 1 | rst_mode | | | | | | X | | X | X | X | Dap80-Menu |
| 1080 | 4 | 1 | sc_alarms | | | | | | X | | X | X | X | Dap80-Menu |
| 1081 | 1 | 1 | s_delay | | | | | | X | | X | X | X | Dap80-Menu |
| 1082 | 2 | 1 | t_calib | | | | | | X | | X | X | X | Dap80-Menu |
| 1083 | 1 | 1 | t_dband | | | | | | X | | X | X | X | Dap80-Menu |
| 1084 | 2 | 1 | t_setpt | | | | | | X | | X | X | X | Dap80-Menu |
| 1085 | 4 | 1 | valve_config | | | | | | X | | X | X | X | Dap80-Menu |

| Array Location | Method | Num Elements | Data Field | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 14 | 15 | Message Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1086 | 4 | 1 | voice | | | | | | X | | X | X | X | Dap80-Menu |
| 1100 | 1 | 1 | sensor_1_name | | | | | | | | | x | x | Dap80-Analog |
| 1101 | 1 | 1 | sensor_1_units | | | | | | | | | x | x | Dap80-Analog |
| 1102 | 1 | 1 | sensor_1_type | | | | | | | | | x | x | Dap80-Analog |
| 1103 | 1 | 1 | sensor_1_min_val | | | | | | | | | x | x | Dap80-Analog |
| 1104 | 1 | 1 | sensor_1_max_val | | | | | | | | | x | x | Dap80-Analog |
| 1105 | 1 | 1 | sensor_1_cal | | | | | | | | | x | x | Dap80-Analog |
| 1106 | 1 | 1 | sensor_2_name | | | | | | | | | x | x | Dap80-Analog |
| 1107 | 1 | 1 | sensor_2_units | | | | | | | | | x | x | Dap80-Analog |
| 1108 | 1 | 1 | sensor_2_type | | | | | | | | | x | x | Dap80-Analog |
| 1109 | 1 | 1 | sensor_2_min_val | | | | | | | | | x | x | Dap80-Analog |
| 1110 | 1 | 1 | sensor_2_max_val | | | | | | | | | x | x | Dap80-Analog |
| 1111 | 1 | 1 | sensor_2_cal | | | | | | | | | x | x | Dap80-Analog |
| 1112 | 1 | 1 | sensor_1_input | | | | | | | | | x | x | Dap80-Channels |
| 1113 | 1 | 1 | sensor_2_input | | | | | | | | | x | x | Dap80-Channels |
| 1114 | 1 | 1 | sensor_3_input | | | | | | | | | x | x | Dap80-Channels |

## *Appendix A.2.   Data Table 2 - Point Descriptions*

| FieldServer Array Location | FieldServer Data Field | Point Description | Message Type | D/A Control Panel Type |
|---|---|---|---|---|
| 1 | Zone | Zone ID | DAP config | All |
| 2 | Inhibit | Unit On/ Standby/ Off Status | DAP config | All |
| 3 | Unit Type | Type Of DAP Panel | DAP Unit | All |
| 4 | temp | Current Temperature | DAP Stat | All |
| 5 | hum | Current Humidity | DAP Stat | All |
| 6 | d-temp | Current discharge temperature | DAP Stat | All |
| 7 | mode | Current Unit mode (see note 1) | DAP Stat | All |
| 23 | hold | Current Functions are inhibited by Network (see note 2) | DAP Stat | All |
| 39 | cs_on | Cooling stages on | DAP Stat | All |
| 40 | hs_on | Heating stage on | DAP Stat | All |
| 41 | valvePCT | Openning Percentage of Chilled water valve | DAP Stat | All |
| 42 | hVlvPCT | Openning Percentage of hot water valve | DAP Stat | All |
| 43 | errors | Alarm (see note 3) | DAP Stat | All |
| 57 | hiTemp | Highest Temperature in the last 24 hrs | DAP Stat | All |
| 58 | loTemp | Lowest Temperature in the last 24 hrs | DAP Stat | All |
| 59 | hiHum | Highest Humidity in the last 24 hrs | DAP Stat | All |

| FieldServer Array Location | FieldServer Data Field | Point Description | Message Type | D/A Control Panel Type |
|---|---|---|---|---|
| 60 | LoHum | Lowest Humidity in the last 24 hrs | DAP Stat | All |
| 61 | Chilled_water | Water Valve setting | DAP Stat | All |
| 62 | Compressor_config | Compressor configuration | DAP Stat | All |
| 63 | heat_strip_config | Heating configuration | DAP Stat | All |
| 64 | hum_config | Humidifier configuration | DAP Stat | All |
| 65 | csUtilPct | Utilization Percentage of cooling in the last 24 hrs | DAP Stat | All |
| 66 | hsUtilPct | Utilization Percentage of heating in the last 24 hrs | DAP Stat | All |
| 67 | ValveUtilPct | Utilization Percentage of CW valve in the last 24 hrs | DAP Stat | All |
| 68 | humUtilPct | Utilization Percentage of humidifier in the last 24 hrs | DAP Stat | All |
| 69 | alrm_select_1 | Message for optional alarm Input #1 selection | DAP Stat | All |
| 70 | alrm_select_2 | Message for optional alarm Input #2 selection | DAP Stat | All |
| 71 | alrm_select_3 | Message for optional alarm Input #3 selection | DAP Stat | All |
| 72 | alrm_select_4 | Message for optional alarm Input #4 selection | DAP Stat | All |
| 73 | bitErrors | Alarm History | DAP Stat | All |
| 185 | runtime_c1 | Compressor 1 runtime | DAP-Xtra | All |
| 186 | runtime_c2 | Compressor 2 runtime | DAP-Xtra | All |
| 187 | runtime_c3 | Compressor 3 runtime | DAP-Xtra | DAP046 only |
| 188 | runtime_c4 | Compressor 4 runtime | DAP-Xtra | DAP046 only |
| 189 | runtime_ht1 | Heating stage 1 runtime | DAP-Xtra | All |
| 190 | runtime_ht2 | Heating stage 2 runtime | DAP-Xtra | All |
| 191 | runtime_ht3 | Heating stage 3 runtime | DAP-Xtra | All |
| 192 | runtime_hum | Humidification runtime | DAP-Xtra | All |
| 193 | runtime_evap | Blower/ Fan runtime | DAP-Xtra | All |
| 194 | runtime_cond | Condenser runtime | DAP-Xtra | All |
| 195 | runtime_dehum | dehumidification runtime | DAP-Xtra | All |
| 196 | runtime_esc | Energy saver runtime | DAP-Xtra | All |
| 197 | runtime_cwc | Chilled water Valve runtime | DAP-Xtra | All |
| 198 | errors | Alarm History | DAP-Xtra | All |
| 218 | errage | Alarm History time (hrs) | DAP-Xtra | All |
| 258 | version | DAP II software revision number | DAP-Xtra | All |
| 259 | tmbmair | Temperature setpoint | DAP-Xtra | DAP049,048,046 |
| 260 | tmbhum | Humidity setpoint | DAP-Xtra | DAP049,048,046 |
| 261 | tmbairdb | Temperature deadband | DAP-Xtra | DAP049,048,046 |
| 262 | runtimes | runtimes array (in hrs) | DAP-Xtra | DAP049,048,046 |
| 314 | bitErrors | | DAP-Xtra | DAP049,048,046 |

| FieldServer Array Location | FieldServer Data Field | Point Description | Message Type | D/A Control Panel Type |
|---|---|---|---|---|
| 474 | adj_rate | Adjustment rate | DAP Menu | DAP049,048,046 |
| 478 | alrm_delay_1 | optional alarm 1 delay setting | DAP Menu | DAP049,048,046 |
| 479 | alrm_delay_2 | optional alarm 2 delay setting | DAP Menu | DAP049,048,046 |
| 480 | alrm_delay_3 | optional alarm 3 delay setting | DAP Menu | DAP049,048,046 |
| 481 | alrm_enable_1 | Enable optional alarm 1 for alarm relay | DAP Menu | DAP049,048,046 |
| 482 | alrm_enable_2 | Enable optional alarm 2 for alarm relay | DAP Menu | DAP049,048,046 |
| 483 | alrm_enable_3 | Enable optional alarm 3 for alarm relay | DAP Menu | DAP049,048,046 |
| 484 | alrm_select_1 | Select alarm message for Optional alarm input 1 | DAP Menu | DAP049,048,046 |
| 485 | alrm_select_2 | Select alarm message for Optional alarm input 2 | DAP Menu | DAP049,048,046 |
| 486 | alrm_select_3 | Select alarm message for Optional alarm input 3 | DAP Menu | DAP049,048,046 |
| 487 | Chilled_water | Chilled water Valve configuration | DAP Menu | DAP049,048,046 |
| 488 | Compressor_config | Compressor configuration | DAP Menu | DAP049,048,046 |
| 489 | c_mode | Unit in Centigrade temperature mode? | DAP Menu | DAP049,048,046 |
| 490 | fire_lim | Firestat temperature setting | DAP Menu | DAP049,048,046 |
| 491 | heat_strip_config | Heating configuration | DAP Menu | DAP049,048,046 |
| 492 | hi_cal | A to D high limit setting | DAP Menu | DAP049,048,046 |
| 493 | hi_h_limit | High humidity alarm limit setting | DAP Menu | DAP049,048,046 |
| 494 | hi_t_lim | High temperature alarm limit setting | DAP Menu | DAP049,048,046 |
| 495 | humid_config | Humidifer configuration | DAP Menu | DAP049,048,046 |
| 496 | h_calib | Humidity calibration offset | DAP Menu | DAP049,048,046 |
| 497 | lead_lag | Compressor lead/lag setting | DAP Menu | DAP049,048,046 |
| 498 | loc_h_ddband | humidity deadband setting | DAP Menu | DAP049,048,046 |
| 499 | loc_h_setpt | Humidity setpoint | DAP Menu | DAP049,048,046 |
| 500 | loc_t_dband | Temperature deadband setting | DAP Menu | DAP049,048,046 |
| 501 | loc_t_setpt | Temperature setpoint | DAP Menu | DAP049,048,046 |
| 502 | lo_cal | A to D low limit setting | DAP Menu | DAP049,048,046 |
| 503 | lo_h_lim | Low humidity alarm limit setting | DAP Menu | DAP049,048,046 |
| 504 | lo_t_lim | Low temperature alarm limit setting | DAP Menu | DAP049,048,046 |
| 505 | main_int | Maintenance schedule setting | DAP Menu | DAP049,048,046 |
| 506 | passwd_a | Password A setting | DAP Menu | DAP049,048,046 |
| 507 | passwd_b | Password B setting | DAP Menu | DAP049,048,046 |

| FieldServer Array Location | FieldServer Data Field | Point Description | Message Type | D/A Control Panel Type |
|---|---|---|---|---|
| 508 | rst_mode | Restart mode setting | DAP Menu | DAP049,048,046 |
| 509 | s_delay | Start delay setting (in seconds) | DAP Menu | DAP049,048,046 |
| 510 | t_calib | Temperature calibration offset | DAP Menu | DAP049,048,046 |
| 511 | voice | Audible alarm tone setting | DAP Menu | DAP049,048,046 |
| 512 | vvrg | Chilled water output voltage setting | DAP Menu | DAP049,048,046 |
| 513 | cat1 | Alarm relay #1 category selection | DAP Menu | DAP 046 |
| 514 | cat2 | Alarm relay #2 category selection | DAP Menu | DAP 046 |
| 515 | cat3 | Alarm relay #3 category selection | DAP Menu | DAP 046 |
| 516 | d_calib | Discharge Air sensor calibration offset | DAP Menu | DAP 046 |
| 517 | lo_d_lim | Low Discharge temperature limit setting | DAP Menu | DAP 046 |
| 518 | ptc | Person to contact on alarm message | DAP Menu | DAP 046 |
| All the points of Chiller Panel are omitted from this list | | | | |
| 899 | adj_rate | Adjustment rate setting | DAP80 Menu | DAP80 |
| 900 | alrm_delay_1 | optional alarm 1 delay setting | DAP80 Menu | DAP80 |
| 901 | alrm_delay_2 | optional alarm 2 delay setting | DAP80 Menu | DAP80 |
| 902 | alrm_delay_3 | optional alarm 3 delay setting | DAP80 Menu | DAP80 |
| 903 | alrm_delay_4 | optional alarm 4 delay setting | DAP80 Menu | DAP80 |
| 904 | alrm_select_1 | Select alarm message for Optional alarm input 1 | DAP80 Menu | DAP80 |
| 905 | alrm_select_2 | Select alarm message for Optional alarm input 2 | DAP80 Menu | DAP80 |
| 906 | alrm_select_3 | Select alarm message for Optional alarm input 3 | DAP80 Menu | DAP80 |
| 907 | alrm_select_4 | Select alarm message for Optional alarm input 4 | DAP80 Menu | DAP80 |
| 908 | ant_enable | Humidity anticipation setting (on/off) | DAP80 Menu | DAP80 |
| 909 | autoflush_time | Autoflush timer setting | DAP80 Menu | DAP80 |
| 910 | auto_ack | Automatic self-test acknowledge | DAP80 Menu | DAP80 |
| 911 | Comp_config | Compressor configuration | DAP80 Menu | DAP80 |
| 912 | control_type | Control type setting | DAP80 Menu | DAP80 |
| 913 | c_mode | display temperature mode (F or C degree) | DAP80 Menu | DAP80 |
| 914 | DA_volts | Water Valve voltage range setting | DAP80 Menu | DAP80 |
| 915 | dehum_on | Dehumidification mode selection | DAP80 Menu | DAP80 |

| FieldServer Array Location | FieldServer Data Field | Point Description | Message Type | D/A Control Panel Type |
|---|---|---|---|---|
| 916 | d_calib | Discharge Air sensor calibration offset | DAP80 Menu | DAP80 |
| 917 | esaver_supp_comp | Energy saver supplement mode setting | DAP80 Menu | DAP80 |
| 918 | fire_lim | Firestat temperature limit setting | DAP80 Menu | DAP80 |
| 919 | heater_config | Heating configuration | DAP80 Menu | DAP80 |
| 920 | hi_h_lim | High humidity alarm limit setting | DAP80 Menu | DAP80 |
| 921 | hi_t_lim | High temperature alarm limit setting | DAP80 Menu | DAP80 |
| 922 | humid_config | Humidifier configuration | DAP80 Menu | DAP80 |
| 923 | h_calib | Humidity calibration offset | DAP80 Menu | DAP80 |
| 924 | h_dband | humidity deadband setting | DAP80 Menu | DAP80 |
| 925 | lead_lag | Compressor lead/lag setting | DAP80 Menu | DAP80 |
| 926 | lo_d_lim | Low Discharge temperature limit setting | DAP80 Menu | DAP80 |
| 927 | lo_h_lim | Low humidity alarm limit setting | DAP80 Menu | DAP80 |
| 928 | lo_t_lim | Low temperature alarm limit setting | DAP80 Menu | DAP80 |
| 929 | main_int | Maintenance schedule setting | DAP80 Menu | DAP80 |
| 930 | network_id | set unit Network ID | DAP80 Menu | DAP80 |
| 931 | nom_h_setpt | Humidity setpoint | DAP80 Menu | DAP80 |
| 932 | password | password | DAP80 Menu | DAP80 |
| 933 | ptc | Person to contact on alarm message | DAP80 Menu | DAP80 |
| 934 | relay_1_mask_0 | selection for alarm contact | DAP80 Menu | DAP80 |
| 950 | relay_1_mask_1 | selection for alarm contact | DAP80 Menu | DAP80 |
| 966 | relay_1_mask_2 | selection for alarm contact | DAP80 Menu | DAP80 |
| 982 | relay_2_mask_0 | selection for alarm contact | DAP80 Menu | DAP80 |
| 998 | relay_2_mask_1 | selection for alarm contact | DAP80 Menu | DAP80 |
| 1014 | relay_2_mask_2 | selection for alarm contact | DAP80 Menu | DAP80 |
| 1030 | relay_3_mask_0 | selection for alarm contact | DAP80 Menu | DAP80 |
| 1046 | relay_3_mask_1 | selection for alarm contact | DAP80 Menu | DAP80 |
| 1062 | relay_3_mask_2 | selection for alarm contact | DAP80 Menu | DAP80 |
| 1078 | reverse_valve | Chilled water direction setting | DAP80 Menu | DAP80 |
| 1079 | rst_mode | Restart mode setting | DAP80 Menu | DAP80 |
| 1080 | sc_alarms | Compressor short cycle setting | DAP80 Menu | DAP80 |
| 1081 | s_delay | Start delay setting (in seconds) | DAP80 Menu | DAP80 |
| 1082 | t_calib | Temperature calibration offset | DAP80 Menu | DAP80 |
| 1083 | t_dband | Temperature deadband setting | DAP80 Menu | DAP80 |
| 1084 | t_setpt | Temperature setpoint | DAP80 Menu | DAP80 |

| FieldServer Array Location | FieldServer Data Field | Point Description | Message Type | D/A Control Panel Type |
|---|---|---|---|---|
| 1085 | Valve_config | Chilled water Valve configuration | DAP80 Menu | DAP80 |
| 1086 | voice | Audible alarm tone setting | DAP80 Menu | DAP80 |
| 1100 | sensor_1_name | Optional Analog sensor 1 name | DAP80 Menu | DAP80 W/analog |
| 1101 | sensor_1_units | Optional Analog sensor 1 units | DAP80 Menu | DAP80 W/analog |
| 1102 | sensor_1_type | Optional Analog sensor 1 Type | DAP80 Menu | DAP80 W/analog |
| 1103 | sensor_1_min_val | Optional Analog sensor 1 minimum value | DAP80 Menu | DAP80 W/analog |
| 1104 | sensor_1_max_val | Optional Analog sensor 1 maximum value | DAP80 Menu | DAP80 W/analog |
| 1105 | sensor_1_cal | Optional Analog sensor 1 calibration offset | DAP80 Menu | DAP80 W/analog |
| 1106 | sensor_2_name | Optional Analog sensor 2 name | DAP80 Menu | DAP80 W/analog |
| 1107 | sensor_2_units | Optional Analog sensor 2 units | DAP80 Menu | DAP80 W/analog |
| 1108 | sensor_2_type | Optional Analog sensor 2 Type | DAP80 Menu | DAP80 W/analog |
| 1109 | sensor_2_min_val | Optional Analog sensor 2 minimum value | DAP80 Menu | DAP80 W/analog |
| 1110 | sensor_2_max_val | Optional Analog sensor 2 maximum value | DAP80 Menu | DAP80 W/analog |
| 1111 | sensor_2_cal | Optional Analog sensor 2 calibration offset | DAP80 Menu | DAP80 W/analog |
| 1112 | sensor_1_input | sensor 1 input | DAP80 Menu | DAP80 W/analog |
| 1113 | sensor_2_input | sensor 2 input | DAP80 Menu | DAP80 W/analog |
| 1114 | sensor_3_input | sensor 3 input | DAP80 Menu | DAP80 W/analog |

| Note 1:mode: 2' bit definitions: | | Note 2: hold:  2' bit definitions: | |
|---|---|---|---|
| 0X01 | Unit is in centigrade mode | 0X01 | needed cooling is inhibited |
| 0X02 | RFU , always 1 | 0X02 | needed heatingg is inhibited |
| 0X04 | RFU , always 1 | 0X04 | needed humidification is inhibited |
| 0X08 | Unit is dehumidifying | 0X08 | needed dehumidification is inhibited |
| 0X10 | Unit is humidifying | 0X10 | not used |
| 0X20 | Energy save is active | 0X20 | not used |
| 0X40 | not used | 0X40 | Network"standby" inhibit is active |
| 0X80 | not used | 0X80 | Network"off" inhibit is active |

| Note 2: errors: 7*2' bit definitions: | | |
|---|---|---|
| 00 | Manual override:check bypass switches | errors[0], bit 0x01 |
| 01 | water detected under floor | errors[0], bit 0x02 |
| 02 | No air flow, check belt and motor | errors[0], bit 0x04 |
| 03 | dirty filter: check  filter | errors[0], bit 0x08 |
| 04 | Humidifier problem: check water pressure | errors[0], bit 0x10 |
| 05 | Low voltage warning | errors[0], bit 0x20 |
| 06 | Firestat alarm, unit shutdown | errors[0], bit 0x40 |
| 07 | compressor short cycle | errors[0], bit 0x80 |
| 08 | power problem or unit restart | errors[1], bit 0x01 |
| 09 | humidity sensor problem | errors[1], bit 0x02 |
| 10 | temperature sensor problem | errors[1], bit 0x04 |
| 11 | schedule maintenance due | errors[1], bit 0x08 |
| 12 | high presure C1: manual reset | errors[1], bit 0x10 |
| 13 | low presure C1: auto reset | errors[1], bit 0x20 |
| 14 | high presure C2: manual reset | errors[1], bit 0x40 |
| 15 | low presure C2: auto reset | errors[1], bit 0x80 |
| 16 | smoke detector: unit shutdown | errors[2], bit 0x01 |
| 17 | No water flow :check pump | errors[2], bit 0x02 |
| 18 | Discharge temperature sensor problem | errors[2], bit 0x04 |
| 19 | High Temperature warning | errors[2], bit 0x08 |
| 20 | Low temperature warning | errors[2], bit 0x10 |
| 21 | High humidity warning | errors[2], bit 0x20 |
| 22 | low humidity warning | errors[2], bit 0x40 |
| 23 | Fan motor overload: check motor amperage | errors[2], bit 0x80 |
| 24 | Local alarm 1: see tag inside door | errors[3], bit 0x01 |
| 25 | Local alarm 2: see tag inside door | errors[3], bit 0x02 |
| 26 | Local alarm 3: see tag inside door | errors[3], bit 0x04 |
| 27 | Local alarm 4: see tag inside door | errors[3], bit 0x08 |
| 28 | Standby Pump on: check primary pump | errors[3], bit 0x10 |
| 29 | UPS power on: check primary power | errors[3], bit 0x20 |
| 30 | Custom message on optional input 1 | errors[3], bit 0x40 |
| 31 | Custom message on optional input 2 | errors[3], bit 0x80 |
| 32 | Custom message on optional input 3 | errors[4], bit 0x01 |
| 33 | Custom message on optional input 4 | errors[4], bit 0x02 |
| 34 | Humidification inhibited | errors[4], bit 0x04 |
| 35 | Reheat inhibited | errors[4], bit 0x08 |
| 36 | Reheat and humidification inhibited | errors[4], bit 0x10 |
| 37 | Discharge air temperature limit | errors[4], bit 0x20 |
| 38 | Reheat mode during dehumidication | errors[4], bit 0x40 |
| 39 | Manual override:check bypass switches | errors[4], bit 0x80 |
| 40 | High condensate water level | errors[5], bit 0x01 |

## *Appendix A.3.   Data Table 3 - Unit Types*

When the driver reads everything from a device it must first obtain the device's unit type so that it can determine what other data is available. Once the unit type is obtained then the driver updates the 'Unit-Type' field visible on the node screen of the RUIDebug program. The unit type is also available in the Data Array defined in table 4.4.5.1.

The following table lists the unit types that can be processed by this driver.

| Unit Type | Numeric Unit Type | Description |
|---|---|---|
| "-" | 0 | Unknown/unavailable/un-initialized |
| "1" | 1 | 044 data logger |
| "2" | 2 | 046 expanded DAP |
| "3" | 3 | 046 2 mod chiller |
| "4' | 4 | 046 3 mod chiller |
| "5" | 5 | 048 DAP, 80-character display |
| "6" | 6 | 049 DAP, 16-character display |
| "7" | 7 | 080 DAP II, no relay expansion |
| "8" | 8 | 080 Chiller II |
| "9" | 9 | 080 DAP II, with relay expansion |
| "10" | 10 | Not Defined |
| "11" | 11 | Not Defined |
| "12" | 12 | Not Defined |
| "13" | 13 | Not Defined |
| "E" | 14 | 080 DAP II, with analog module |
| "F" | 15 | 080 DAP II, with relay and analog |

## Appendix B. Advanced Topics

### *Appendix B.1.   Additional Driver Specific Map Descriptor Parameters*

The driver offers advanced configuration by adding to and extending the Map Descriptors specific to the Dart Serial Driver.

| Column Title | Function | Legal Values |
|---|---|---|
| DA_Func* | Specifies the Data Aire Command/Query function to be used.  Use a function appropriate to the type of Server (DAP/Chiller/DAP80) and the type of data required. | Numeric/Text.  See Appendix B.2 for a list of possible values. |
| DA_Field* | Specifies the data field to be retrieved from the Server device.  Servers are only capable of responding with a data composite consisting of many data fields. This parameter is used to specify the parameters to be extracted from the data composite.<br><br>Note[1]. | Text.  See Appendix B.3 for a list of possible values as well as Table 4.4.5.1 |
| DA_Assoc* | This field is used to make the association between passive and active (rdbc/wrbc) Map Descriptors addressing the same node. Give the rdbc and its associated passive Map Descriptors the same value (any number) and give the wrbc and its passive Map Descriptors another value for DA_Assoc. | Any positive integer. |
| Da_Freq | Used only for connection to DART's. Specifies in milliseconds the intervals between wrbc/rdbc Map Descriptor execution. | > 18000 (3 minutes)<br>30000 (5 minutes) recommended |
| DA_Method$^\psi$ | Specifies the extraction method. Such as Hex-ASCII to decimal number in 10's of a degree, | See Appendix B.4 for a list of possible values. |
| DA_Bytcnt$^\psi$ | Specifies the number of bytes that are to be processed by the method specified above. For method#6 which processes an array of elements the DA_Bytcnt specifies the number of bytes that constitute each element of the array. | >= 1 |
| DA_Offset$^\psi$ | An offset into the data composite that is returned when the Server is polled. The offset is the number of bytes from the first data byte. | 0 to the length of the data composite. No validation is performed. |
| DA_Elecnt$^\psi$ | Number of elements that are produced by the extraction method. | >= 1 |

---

$^\psi$ These parameters are only required for custom data extractions not provided for with DA_Field parameter.

### Appendix B.2.   DA_Func Parameter - Permitted values.

The driver supports a limited subset of the Dart Poll & Response Functions.  The selection of the sub-set is based on the identification of useful & practical functions.

In addition to the 'Everything' keyword indicated in chapter 4 the following specific query functions are implemented.

| Func. | Description | Driver Parameter | Protocol Id. |
|---|---|---|---|
| '1' | DART Config Query | DA_Func = dart-config | 49 |
| '2' | Dart Psswd Query | DA_Func = dart-password | 50 |
| '3' | DAP Config Command | DA_Func = dap-config | 51 |
| '4' | DAP Log Query | DA_Func = dap-log | 52 |
| '5' | DAP Unit-Type Query | DA_Func = dap-unit | 53 |
| '6' | DAP Stat Query | DA_Func = dap-stat | 54 |
| '7' | DAP Xtra Query | DA_Func = dap-xtra | 55 |
| '8' | DAP Menu Query | DA_Func = dap-menu | 56 |
| 'A' | Chiller Stat Query | DA_Func = chiller-stat | 65 |
| 'B' | Chiller Xtra Query | DA_Func = chiller-xtra | 66 |
| 'C' | Chiller Menu Query | DA_Func = chiller-menu | 67 |
| 'D | Dart Status | DA_Func = dart-status | 68 |
| 'E' | DAP80 Menu Query | DA_Func = dap80-menu | 69 |
| 'G' | DAP Analog Query | DA_Func = dap80-analog | 71 |
| 'H' | DAP Channels Query | DA_Func = dap80_channles | 72 |

Each of the above queries returns a complex set of data consisting of many sub-fields. Contact Data-Aire for a complete listing of the data composite returned.

The following special / diagnostic functions are also implemented.

| Driver Parameter | Protocol Id. |
|---|---|
| DA_Func = All-Listen | 11 |
| DA_Func = Ack | 6 |
| DA_Func = Dart-Transparant | 2 |
| DA_Func = Dart-Opaque | 3 |
| DA_Func = Test-Echo | 16 |
| DA_Func = Test-No-Echo | 15 |
| DA_Func = Unit-Talk | 13 |

With the exception of the Unit-Talk transmission of this command, these are nodeless commands to allow the units time to switch their mechanical command.  When using any of these special commands no other DA_* fields need be specified.

All-Listen instructs the all units in the network to switch their relays to the listen position. Those units already in the listen position will do nothing.  Those in the talk position will first echo the all-listen command and then switch their relays to the listen position.  A pause of 0.15 seconds is required after the relays.

*Appendix B.3.   DA_Field Parameter - Permitted values[4].*

| DA_Field Legal Values | Description | | |
|---|---|---|---|
| | | **DA_Func** | **# Bytes** |
| All | The whole data record returned by the Server is stored in the Data Array byte for byte. The number of bytes written is dependent on the DA_Func. | DA_Func=dart-password | 231 |
| | | DA_Func=dart-config | 41 |
| | | DA_Func=dap-config | 4 |
| | | DA_Func=dap-log | 240 |
| | | DA_Func=dap-unit | 1 |
| | | DA_Func=dap-stat | 68 |
| | | DA_Func=dap-xtra | 124 |
| | | DA_Func=dap-menu | 103 |
| | | DA_Func=chiller-stat | 54 |
| | | DA_Func=chiller-xtra | 104 |
| | | DA_Func=chiller-menu | 89 |
| | | DA_Func=dap80-menu | 138 |
| | | DA_Func=dart-status | 9 |
| | | DA_Func=dap80-analog | 36 |
| | | DA_Func=dap80-channels | 12 |
| Special | Indicates that a user defined extraction is specified in the Map Descriptor. When this value is specified as the DA_Field value then DA_Method, DA_Bytcnt, DA_Offset, DA_Elecnt must also be specfied. | | |

*Appendix B.4.   DA_Method Parameter Values and Notes*

The DA_Method specifies a method for interpreting a range of bytes when the DA_Field=special.

| Method # | Description |
|---|---|
| Method 1: | Each byte is valid when it contains only one of the following ASCII characters. { 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D,  E,  F } Each byte being parsed is considered to be a hexadecimal digit with the most significant digit being the left-most byte. The four bytes 30 31 32 33 (hex) are therefore interpreted as the hexadecimal number 0123 and the decimal value is equal to 291. |
| Method 2 | As method 1, but used for humidity's and temperatures which are transmitted as the number of tenths of a unit – Thus the 4 bytes yield the decimal number 29.1 °F/%. |
| Method 3 | Each byte is regarded as containing a hexadecimal digit in ASCII format. Example: incoming byte contains 41(hex).  -> regarded as the hexadecimal digit 'A' in ASCII format. The hex digit is converted to a series of 8 bits. In this example the bits are 00001010 with the msb being the left-most. |
| Method 4 | As Method 3 except that the decimal value of this digit is written to the Data Array. In this example the number 10 would be written to the Data Array. |
| Method 5 | There is no translation - the raw bytes are written to the data array. |
| Method 6 | Processes an array of elements using method 1 translation.  The raw data being parsed is considered to consist of DA_elecnt elements each consisting of DA_bytecnt bytes. |

---

[4] See Section Appendix A for all other keywords.

## *Appendix B.5. Advanced Map Descriptor 1:Collecting Data From Multiple Fileds*

// Client Side Nap Descriptors

| Map_Descriptor_Name, | Data_Array_Name, | Data_Array_Offset, | Function, | Node_name, | Address, | Length, | DA_Func, | DA_Field, | Scan_Interval |
|---|---|---|---|---|---|---|---|---|---|
| A1, | DA_AI3, | 0, | RDBC | Node_A, | 0, | 1, | dap-stat, | temp, | 5 |
| A2, | DA_AI3, | 1, | passive, | Node_A, | 0, | 1, | dap-stat, | hum, | 5 |
| A3, | DA_AI3, | 2, | passive, | Node_A, | 0, | 1, | dap-stat, | d_temp, | 5 |
| A4, | DA_AI3, | 3, | passive, | Node_A, | 0, | 1, | dap-stat, | hiTemp, | 5 |
| A5, | DA_AI3, | 4, | passive, | Node_A, | 0, | 1, | dap-stat, | loTemp, | 5 |
| A6, | DA_AI2, | 0, | passive, | Node_A, | 0, | 1, | dap-stat, | cs_on, | 5 |
| A7, | DA_AI2, | 1, | passive, | Node_A, | 0, | 1, | dap-stat, | hs_on, | 5 |

The scan time is only important for the active Map Descriptor.

Server is a DAP reading status information.

These parameters must be typed in exactly as specified in this manual. They are case sensitive. The format of the data extracted depends on the parameter.

All these Map Descriptors read their data from the same Server

All these Map Descriptors address Node_A therefore only one Map Descriptor needs to read (rdbc) the node. The remaining Map Descriptors can be passive (thus optimizing communications.)

It would be sensible for DA_AI3 to be an array of FLOATs because the temps and humidity's return real numbers with one digit after the decimal point.

DA_AI2 could be any type of array other than BIT because the values returned for these parameters are whole numbers less than 255.

## *Appendix B.6.   Advanced Map Descriptor Example 2:Collecting Error Messages*

The DAP-II Status query returns 14 bytes of errors & status information. The arrangement and meaning of these bytes is defined by the Data Aire Corporation and is also dependent on the type of DAPII module being polled.

```
// Client Side Map Descriptors

Map_Descriptor_Name,  Data_Array_Name,  Data_Array_Offset,  Function,  Node_name,  Address,  Length,  DA_Func,    DA_Field,   Scan_Interval
A1,                   DA_AI1,           0,                  RDBC,      Node_A,     0,        1,        dap-stat,   errors,     5
A2,                   DA_AI1,           1,                  passive,   Node_A      0,        1,        dap-stat,   bitErrors,  5
```

BitErrors is a synonym for errors. The data is extracted using a different data format.

Server is a DAP and is reading status information.

Data arrangement and meaning of each error is defined by Data Aire Corp.

Example: Bit 24 is a LOW TEMP WARNING for DAPII-044/8/9 units.

Example: Bit 09 is a HUMIDITY SENSOR PROBLEM for a DAPII-080 unit

The 'errors' key word returns 14 bytes, thus the DA_AI1 should be a BYTE array. Each byte will have values 0-15 to represent the value of the bits in each byte.

The bitErrors extracts the same data from the DAP but presents it as a series of 14x8 bits. Thus DA_DI1 should be a BIT array

## *Appendix B.7.   Advanced Map Descriptor Example 3: Using Special DA Field*

```
// Client Side Map Descriptors

Map_Descriptor_Name,  Data_Array_Name,  Data_Array_Offset,  Function,  Node_name,  Address,  Length,  DA_Func,    DA_Field,  DA_Method,  DA_Bytecnt,  DA_Offset,  DA_Elecnt,  Scan_Interval
A1,                   DA_AI3,           0,                  RDBC,      Node_A,     0,        1,        dap-stat,   special,   1,          4,           10,         1,          5
```

Performs a DAP status query

Specials can be used as rdbc and passive Map Descriptors.

If parameter 'special' is used, additional parameters must be specified.

See Appendix B.4 for descriptions on how these extraction methods work.

From the data bytes returned by the Server, extract 4 bytes starting at byte 10 and apply method 1 to convert the bytes before writing them to the FieldServer Data Array.

It would be sensible for DA_AI3 to be an array of Floats because extraction method#1 returns a floating point number.

## Appendix B.8.   Advanced Map Descriptor Example 4: - Using DA_Assoc

// Client Side Map Descriptors

| Map_Descriptor_Name, | Data_Array_Name, | Data_Array_Offset, | Function, | Node_name, | Address | Length | DA_Func | DA_Field | DA_Assoc | Scan_Interval |
|---|---|---|---|---|---|---|---|---|---|---|
| A1, | DA_AI3, | 0, | RDBC | Node_A, | 0, | 1, | dap80-menu | All, | 1 | 5 |
| A2, | DA_AI3, | 1, | passive, | Node_A | 0, | 1, | dap80-menu | alm_delay_1, | 1 | 5 |
| A3, | DA_AI3, | 2, | passive, | Node_A | 0, | 1, | dap80-menu | alm_delay_2, | 1 | 5 |
| A4, | DA_AI3, | 3, | passive, | Node_A | 0, | 1, | dap80-menu | alm_delay_3, | 1 | 5 |
| A8, | DA_AI4, | 0, | WRBC, | Node_A | 0, | 1, | dap80-menu | nom_h_setpt, | 2 | 5 |
| A9, | DA_AI4, | 1 | passive, | Node_A | 0, | 1, | dap80-menu | t_setpt,, | 2 | 5 |

DA_Assoc associates the passives with the correct active Map Descriptor. Map Descriptors A2, 3, 4 are associated with A1 by the value of DA_Assoc=1
Map Descriptor A9 is associated with A8 by value of DA_Assoc=2

Potential confusion for the FieldServer because the node and the DA_Func's are the same for all the Map Descriptors.

Solve this problem using DA_Assoc.

A 'Read' and some passive Map Descriptors to extract other data fields from the same read. (optimizes communications)

Read must precede the passive's.

## Appendix B.9.   Advanced Map Descriptor: Example 5 - Using a special / diagnostic command.:

// Client Side Map Descriptors

| Map_Descriptor_Name, | Data_Array_Name, | Data_Array_Offset, | Function, | Node_Name, | Address, | Length, | DA_Func, | Scan_Interval |
|---|---|---|---|---|---|---|---|---|
| A1, | UNUSED_ARRAY, | 0, | WRB, | No_Node, | 0, | 1, | All-Listen, | 5 |

This command is sent only once.  To do this periodically change this to wrbc.

Must connect this Map Descriptor to a node whose Node_ID is zero. For example.

Nodes
| Node_Name, | Node_ID, | Protocol, | Port |
|---|---|---|---|
| Unit1, | 0, | Daire, | R1 |

This is a special / dianostic command. It causes a one byte message to be sent.

A Data Array must be associated with the Map Descriptor even though it will not be used. It may be any data type.

## *Appendix B.10. Advanced Map Descriptor: Example 6 – Turning Dap's On/Off.*

This Map Descriptor sends a Dap-Config command to the DAP device. The Map Descriptor extracts two consecutive values from the Data Array the first value being the zone number and the second the inhibit value. Additional information is provided in 0.

// client Side Map Descriptors

| Map_Descriptor_Name, | Data_Array_Name, | Data_Array_Offset, | Function, | Node_name, | Address, | Length, | DA_Func, | Scan_Interval |
|---|---|---|---|---|---|---|---|---|
| INH_04, | DA_WR_01, | 0, | WRBC, | Node_A, | 0, | 2, | Dap-Config, | 5 |

Two elements of this array are used. The value found at offset 0 is the zone number. The value found at offset 1 is the inhibit code which is used to inhibit/run units.

## Appendix C. Troubleshooting Tips

### Appendix C.1.   Bad Values

In the event that the driver cannot correctly decode the raw bytes it will generally write a value which indicates bad data.  In most cases the indicating value is -1 or 65535 (depending on data type).  When setting bits for status fields the driver will not write new data to the array if the incoming byte is invalid.  Consult the error log for indication of this type of problem.

**Example**: Valid ASCII digits are 0...9, A...F.  If a byte is being parsed and a hex digit is expected but not found then the driver considers this an error and writes the bad value indication **OR** produces an error message when the bad value indication cannot be used.

### Appendix C.2.   Dead Nodes

When a node is absent or dies, the driver may go idle and stop communicating with all other nodes.  This problem is specific to the Data Aire devices.

### Appendix C.3.   Noise

A high percentage of responses on the secondary port are preceded with noise.  The driver is generally able to filter this noise because legitimate characters in a response are limited to the ASCII character set and a few control characters.  The driver does not filter noise in the middle of a message.  Thus the message will fail (generally as a checksum failure) when there is noise in the middle of a message.  This is normal for most drivers.

### Appendix C.4.   Ignored Messages

Ignored messages which are messages sent by a DAP/DART for which the driver cannot find an appropriate Map Descriptor are reported by the driver.  This simply indicates that a message containing information that is not required is being discarded.  The current version of the driver ignores a few messages relating to the status of the DART device.  Later versions of the driver will be capable of storing these messages and the number of ignored messages will decrease.

### Appendix C.5.   Driver limitation

Unable to reset run times.

### Appendix C.6.   Baud Rate.

Rev 9.5 of the DAP firmware changed the baud rate from 2400 to 9600.  All units must have the same baud rate on the network.  The customer should check the firmware version of each unit and record these in a table. FieldServer recommends that all units have the same version due to the fact that instability between different versions has been experienced.

### Appendix C.7.   Wiring.

This must be completed exactly as specified by Data Aire.  Variations in the wiring invariably causes problems.  The wit=ring/installation guide is available from Data Aire.

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## *Appendix C.8.   Stuck Unit.*

Communications on the DAP units requires the operation of a mechanical relay.  This can get stuck.  The Front Panel menu of each DAP unit allows a user to execute a diagnostic test of the comms board.  The customer should execute this test and use the Data Aire installation guide to resolve any issues.  Typically a failed unit requires replacement.  A single failed card will fail the whole network.  The FieldServer sends polls on the primary port and expects responses on the secondary port.  The fact that we get back a copy of the poll message on the secondary port does not mean that the units are operating correctly since this is possible when the units are stuck in pass thru mode.

## *Appendix C.9.   Number of Units*

Up to 250 DAP devices can be connected to a FieldServer using the DAP driver.
Normal RS485 network considerations apply - these limit the number of units based on the load of each node.
- For unit loads only 32 devices per network can be used.
- For .25 unit loads 128 devices can be used on one network segment.  If more than 32 full unit loads are required then the network must be segmented and connected via a repeater
- It may be necessary to use a repeater if total RS-485 length exceeds 1000ft.

It is recommended that tests are performed with a single or few units.

## Appendix D. Error Messages

| Message | Description | Discussion |
|---|---|---|
| DAP:#1 | FYI. The Map Descriptor called <%s> is too short. | The Map Descriptor used to expose driver stats must be 500 elements long. Change the length parameter and ensure that the Data Array is long enough too[5] |
| DAP:#2 | FYI. You could have used a Map Descriptor called <%s> to expose diagnostic info. | This message is for information only and may be ignored. The driver is capable of exposing performance and communication statistics. See Appendix D.1 for more information |
| DAP:#3 | Err. Method3 requires even number of bytes. nb= %d Map Descriptor= <%s> | May be a corrupted message. If frequently occurring, take a log and report to FieldServer Technical Services. |
| DAP:#4a | Err. Method3 is translating invalid bytes. ch1= %d( dec ) %d( dec ) | The protocol only allows certain characters to be transmitted. If an unexpected character is encountered then the error message is printed. If the error occurs frequently the make a log file and report the error to FST. The error may arise from a corrupted message. |
| DAP:#4b | Err: Method2 is translating invalid bytes. ch= %d( dec ) %d( dec) | |
| DAP:#4c | Err: Method1 is translating invalid bytes. ch= %d( dec ) %d( dec) | |
| DAP:#5 | Err. Method3 is translating invalid bytes. ch2= %d( dec ) %d( dec ) | |
| DAP:#6 | Err. Invalid Station (Dec ) %d-%d-%d | Only certain station numbers are legal. (1-260). If the error occurs frequently then make a log file and report the error to FST. The error may arise from a corrupted message. |
| DAP:#7 | Err: Station= %d illegal - forcing to 1 | The CSV file contains a DAP node with an illegal station number. The driver has changed the illegal node number to 1. It is important that this error is corrected or data will be collected from node1.[5] |
| DAP:#8 | Err. secondary_port must be defined. | The DAP driver sends polls on one port and expects responses on a second port, therefore 2 ports must be defined for each DAP network – see Section 4.2[5] |
| DAP:#9 | FYI. Driver on port= %d suitable for NON-Dart applications only. | This message is for information only and may be ignored. The message indicates that the configuration is suitable for connection to a DAP only network. No DART device may be present in the network. |
| DAP:#10 | Err. Invalid Station#(%d) . (1-260) | The CSV file contains a DAP node with an illegal station number. Only station numbers between 1 & 260 are |

---

[5] Edit the CSV file and reset the FieldServer for the changes to take effect.

| Message | Description | Discussion |
|---|---|---|
| | Map Descriptor= <%s> | permitted .5 |
| DAP:#11 | Err. Invalid Daire function (%d) .Map Descriptor= <%s> | The value of the DA_Function parameter specified in the CSV file cannot be recognized by the driver. Read Appendix B.2 for more information.[6] |
| DAP:#12 | Err: Invalid Daire field (%d) .Map Descriptor= <%s> | |
| DAP:#13 | Err. Invalid Daire method (%d) .Map Descriptor= <%s> | The value of the DA_Method parameter specified in the CSV file cannot be recognized by the driver. Read Appendix B.4 for more information.[6] |
| DAP:#14 | Err. Map Desc. Cant understand function= %d <%s> | The value of the DA_Function parameter specified in the CSV file cannot be recognized by the driver. Read Appendix B.2 for more information.[6] |
| DAP:#15 | Err. Map Desc. Cant understand id= %d <%s> | The value of the DA_Field parameter specified in the CSV file cannot be recognized by the driver. Read Appendix B.3 for more information. [6] |
| DAP:#16 | Err. Unknown Response= %X( h) | A message has been received that cannot be recognized. If this error occurs repeatedly, make a log file and report the error to FST. If the error occurs occasionally it may be indicating an occasional corrupt message and may be ignored. |
| DAP:#17 | Err. Unknown Query | |
| DAP:#18 | Err. Unknown Command | |
| DAP:#19 | Err. Unknown Msg Type | |
| DAP:#20 | Writing before Unit Type is known. | If you see this message printed report the fact to FST immediately. |
| DAP:#21 | Err. Cant write this function= %c. Map Descriptor= <%s> | Only certain data is writable. See Section Appendix A.2 for more information.5 |
| DAP:#22 | FYI. Write abandoned. Map Descriptor=<%s>. ch=%d j=%d off=%d dev=<%s> | It is not possible to write to a DAP device before it has been read successfully. This message arises if the device has been read but some data contained in the read is invalid. The driver is preventing the invalid data being written back to the device. If this message only occurs once or twice after the FieldServer is restarted, it may be ignored. If the message occurs repeatedly then take a log file and report the error to FST |
| DAP:#23 DAP:#23a | FYI. Write abandoned. Read incomplete. Will retry. Map Descriptor= <%s> | It isn't possible to write to a DAP device before it has been read successfully. If this message only occurs once or twice after the FieldServer is restarted, it may safely be treated as for information only. If the message occurs repeatedly then the configuration may need changing. |
| DAP:#24 | Err. Rev-Translate: Unknown Method. | Report this error to FST providing a copy of your CSV file. |

---

[6] Edit the CSV file and reset the FieldServer for the changes to take effect.

| Message | Description | Discussion |
|---------|-------------|------------|
| DAP:#25 | Err. Field= <%s> cannot be used for write. Map Descriptor= <%s> | This error arises when (1) a Map Descriptor refers to a field that is not unique but the function has not been specified or (2) when a non-writeable field has been specified. See section 4.4.5 for additional information. This error could also be produced if there are two (or more) write Map Descriptors each having a different DA_Func but with the DA_Assoc values of each Map Descriptor set equal (or implied equal when not set in the csv file). Specify the DA_Assoc parameter for the write Map Descriptor's, ensuring that non-associated Map Descriptor's have different values for this parameter.[7] |
| DAP:#26 | Err. Map Descriptor= <%s> Read: param->daire_function= %c | You are trying to a read/write data from a DAP device and the driver cannot process the specified DA_Function for reading. [7] |
| DAP:#27 | Err. Cant write. function= %d Map Descriptor= <%s> | |
| DAP:#28! | Err. No Map Descriptor's | Report this error to FST providing a copy of your CSV file. |
| DAP:#29 | Err. Map Descriptor= <%s> Special specified with invalid method. | Read Appendix B.4 and review the CSV file. When you have corrected the CSV file reset the FieldServer for the changes to take effect. |
| DAP:#30 | Err. Map Descriptor= <%s> Unknown translation Method= %d | |
| DAP:#31 | Err. Cant translate map desc. Data not stored | Make a log file and report the problem to FST providing a copy of your CSV file. |
| DAP:#32 | Err. Driver does not support unit type='%c' ( node= %d) | The driver found a device whose type is not supported. Remove this node from your CSV file and reset the FieldServer |
| DAP:#33 | Err. Conflicting unit types='%c' vs '%c' ( node= %d) | The expected and discovered unit type are different. The driver will always work with the discovered unit type. |
| DAP:#35 | Err. Cant write to a data logger Map Descriptor= <%s> | Correct the problem by removing the offending map desc and reset the FieldServer for the change to take effect |
| DAP:#36 | FYI. Can't write until unit type is known. Will retry. Map Descriptor= <%s> | This message is printed when you have specified a write with a DA_Field but no DA_Function. Under these circumstances the driver cannot write until it knows the Unit Type of the device. If you are polling using the 'Everything' function then the driver will obtain the unit type in time and the error will not be reproduced. |

[7] Edit the CSV file and reset the FieldServer for the changes to take effect.

| Message | Description | Discussion |
|---|---|---|
| DAP:#37 | Err. Map Descriptor= <%s> Cant write '%s' (%d:%d) to a unit= %d | The DA_Field and DA_Function type specified are not suitable for the Unit_Type found |
| DAP:#38 | FYI. Configured/Reported Unit Types don't match. Node= <%s> | This message may be safely ignored. If the discovered type is what you expect then change the CSV file and reset the FieldServer for you changes to have effect. |
| DAP:#39 | FYI. Poll Delay set to min of %.1f secs | You may safely ignore this message. If is for your information only. If you set the poll delay too short the driver will overwrite your value. The message reports the fact and indicates the minimum poll delay. You should note the poll delay as it affects performance. |
| DAP:#39b | FYI. Poll Delay override for DEBUG = %.1f secs | If you see this message printed report the fact to FST immediately. |
| DAP:#40 | FYI. Diagnostic Poll Sent. Map Descriptor= <%s> | You may safely ignore this message. If is for your information only. It records the fact that a special poll has been sent. |
| DAP:#41 | Err. Write abandoned. Map Descriptor=<%s> Addr=%d Only DAP80-Menu Write Thru's Supported | From 1.06d some write through capability was provided when variables in the 'Everything' array are updated. Only those variables which result in a DAP80-MENU command being sent are supported. |
| DAP:#42 | Err. Write abandoned. Map Descriptor=<%s> Addr=%d. Map Entry not found | The Write Through Failed because the map entry could not be found. The map entry index is calculated by using the cache Map Descriptor normalized address and subtracting the Data Array offset. If the method is failing with error adjust your configuration so that the Data Array Offset is zero. After downloading the modified config and resetting the FieldServer if the error still occurs then take a log and send the log with the configuration to FieldServer's Tech support |

## *Appendix D.1. Exposing Driver Statistics*

In addition to the standard FieldServer communication statistics described in the FieldServer Configuration Manual, the DAP Driver can also expose some driver statistics by writing data to a Data Array. A special Map Descriptor named "dap-stats" is required.

```
Nodes
Node_name,                      Protocol,              Station
null_node   ,                   DAP     ,              1

Data_Arrays
Data_Array_Name ,               Data_Format,           Data_Array_Length
DA_DAP_STATS ,                  UINT32      ,          1000

Map_Descriptors
Map_Descriptor_Name,            Data_Array_Name,       Node_name,              length
dap-stats,           ,          DA_DAP_STATS ,         null_node   ,           1000
```

The driver uses the Data Array DA_DAP _STATS (in this example) to store driver specific statistics in the dap-stats Map Descriptor.  Only one of these Map Descriptors may be specified per FieldServer.

The driver stores the following data.

| | |
|---|---|
| 1 | DRV_DLL_CLIENT_SENDS_MSG |
| 2 | DRV_DLL_CLIENT_SENDS_ACKNAK |
| 3 | DRV_DLL_CLIENT_SENDS_BYTES |
| 4 | DRV_DLL_SERVER_SENDS_MSG |
| 5 | DRV_DLL_SERVER_SENDS_ACKNAK |
| 6 | DRV_DLL_SERVER_SENDS_BYTES |
| 7 | DRV_DLL_CLIENT_RCVS_MSG |
| 8 | DRV_DLL_CLIENT_RCVS_BYTES |
| 9 | DRV_DLL_SERVER_RCVS_MSG |
| 10 | DRV_DLL_SERVER_RCVS_BYTES |
| 11 | DRV_DLL_TIMEOUT |
| 12 | DRV_DLL_ERROR |
| 13 | DRV_DLL_ERROR_CODE |
| 14 | DART_STAT_FAILED_CHECKSUM |
| 15 | DART_STAT_FAILED_FUNCTION |
| 16 | DART_STAT_FAILED_NOSTART |
| 17 | DART_STAT_FAILED_PROTOCOL |
| 18 | DART_STAT_FAILED_IC_TIMEOUT |
| 19 | DART_STAT_NOISE_BYTE_COUNT |
| 20 | DART_STAT_NOISE_BYTE_VALUE |
| 21 | DART_STAT_BUFFER_OVERFLOW |
| 22 | DART_SPECIAL_COMMAND_COUNT |
| 23 | DART_SPECIAL_COMMAND_CODE |
| 24 | DART_MSG_IGNORED_NO_SUITABLE_MAP DESCRIPTORS |
| 25 | DART_FAILED_PARSE |
| 26 | DART_CANT_WRITE1 |
| 27 | DART_CANT_WRITE2 |
| 28 | DART_MSG_IGNORED_NOT_USEFUL |
| 29 | DART_STAT_FAILED_TIMEOUT1 |
| 30 | DART_STAT_FAILED_TIMEOUT2 |
| 31 | DART_IGNORE_MSG_TYPE |
| 32 | DART_TEST1 |
| 33 | DART_TEST2 |
| 34 | DART_MSG_UNEXPECTED_RESPONSE |
| 35 | DART_MSG_UNEXPECTED_CMAP DESCRIPTOR |
| 36 | DART_MSG_UNEXPECTED_QUERY |

## Appendix E. Writing data to DAP Devices

### *Appendix E.1.   Background*

The variables in a DAP device are not individually addressable.  When a DAP device is read a data composite is returned and the driver extracts the required data.  When data is written to a DAP device it is not possible to write a value to one individual data element such as a temperature setpoint. Rather, the DAP devices requires the complete data composite (all its variables, states, settings) be written at once.  This makes the setting of a setpoint a complex operation for the driver.

It involves the following steps
    a.  Read the device, obtain a complete set of data and store (internally in the driver.).
    b.  Use this stored data to form the basis for a write.  Modify the data with the data the user wishes to set.
    c.  Write the modified data composite back to the DAP device.

Thus to complete a 'write' operation successfully, the device must be read successfully.  If the read has not been completed then the write operation will be abandoned.  The driver prints messages to the error logs and records a NODE_OFFLINE stat under these circumstances.

### *Appendix E.2.   Associated Map Descriptors*

When writing to a DAP device it is possible to associate Map Descriptors using the DA_Assoc parameter. T his is straightforward using *WRBC* or *RDBC*.   When using *WRBX* to trigger the writes on change, however, the function of the associated Map Descriptors must be passive if the upstream device block writes the data.  The following diagram outlines the required strategy.
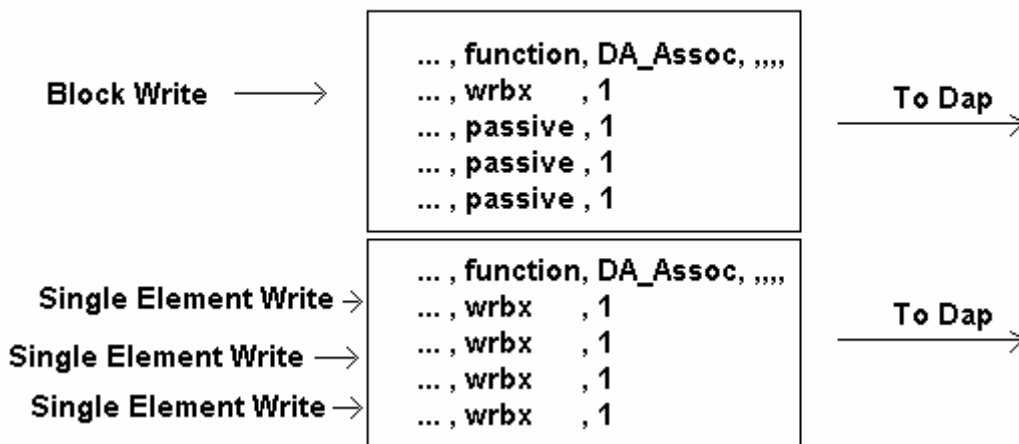
## *Appendix E.3.   Starting/Stopping DAP devices*

The **DAP-Config** command is an **exception** to the above notes.  A read is not required. The DAP Config command is used to turn off/on DAP units.  The Command uses two consecutive array elements.  The first is the zone, the second is the inhibit command. Valid zones are 0-63.

If any inhibit bit (bits 0-5) is set then the unit will not run. If bits 0 to 5 are off then the unit will run. Bits 6& 7 are used for display only on the DAP panel.

0x01 - Inhibit Cooling
0x02 - Inhibit Heating
0x04 - Inhibit Humid
0x08 - Inhibit Dehumidification
0x10 - Inhibit fan
0x20 - Reserved
0x40 - Network Standby - Display on panel (only has no effect on unit)
0x80 - Network off inhibit is active - display only - no effect on operation

This function should be used as a wrbc/x. When the driver encounters this command it reads the associated Data Array, loads the two elements found at the array offset into the message and transmits the message. The driver does not set any Data Array elements to confirm that the command concluded successfully.

Additional information is provided in Appendix B.10

## *Appendix E.4.   DAP Unit Errors*

### Dap-Stat Query

The following table provides information on the storage of errors obtained in response to the Dap-Stat Query.  Note that the errors are stored two ways – One storage method stores 8 alarm bits at a time in a single array element (stored as byte values) – The other method stores each alarm at a different location in the Data Array.

| Byte | Bit | Relative Offset | Location in Data Array (Absolute Offset) Each alarm stored as a separate bit | Location in Data Array (Absolute Offset) Each set of 8 alarms stored as a byte* | 046, 048 and 049 Units | DAP 80 Units |
|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 73 | 44:00 | N/A | Manual Override: check bypass switch ( DapII ver 5.0 or later) |
| 0 | 1 | 1 | 74 | 44:01 | High Pressure Failure Compressor No. 1 | Water detected under floor: check probe |
| 0 | 2 | 2 | 75 | 44:02 | High Pressure Failure Compressor No. 2 | No air flow: check belt and motor |
| 0 | 3 | 3 | 76 | 44:03 | High Pressure Failure Compressor No. 3 | Dirty filter: check filters |

| Byte | Bit | Relative Offset | Location in Data Array (Absolute Offset) Each alarm stored as a separate bit | Location in Data Array (Absolute Offset) Each set of 8 alarms stored as a byte* | 046, 048 and 049 Units | DAP 80 Units |
|---|---|---|---|---|---|---|
| 0 | 4 | 4 | 77 | 43:00 | High Pressure Failure Compressor No. 4 | Humidifier problem: check water pressure |
| 0 | 5 | 5 | 78 | 43:01 | High Pressure Warning Compressor No. 1 | Low voltage warning: check unit |
| 0 | 6 | 6 | 79 | 43:02 | High Pressure Warning Compressor No. 2 | Firestat alarm: unit shutdown |
| 0 | 7 | 7 | 80 | 43:03 | High Pressure Warning Compressor No. 3 | Compressor short cycle warning |
| 1 | 0 | 8 | 81 | 46:00 | High Pressure Warning Compressor No. 4 | Power problem or unit restart |
| 1 | 1 | 9 | 82 | 46:01 | Low Pressure Failure Compressor No. 1 | Humidity sensor problem |
| 1 | 2 | 10 | 83 | 46:02 | Low Pressure Failure Compressor No. 2 | Temperature sensor problem |
| 1 | 3 | 11 | 84 | 46:03 | Low Pressure Failure Compressor No. 3 | Scheduled maintenance due |
| 1 | 4 | 12 | 85 | 44:04 | Low Pressure Failure Compressor No. 4 | High pressure C1: Manual reset required |
| 1 | 5 | 13 | 86 | 44:05 | No Air Flow, Check Belt and motor | Low pressure C1: Manual reset required |
| 1 | 6 | 14 | 87 | 44:06 | Change Filters, High Pressure Drop | High pressure C2: Manual reset required |
| 1 | 7 | 15 | 88 | 44:07 | Local Alarm. See Tag inside Door | Low pressure C2: Manual reset required |
| 2 | 0 | 16 | 89 | 45:00 | Manual Override, service or emergency | Smoke detector: unit shutdown |
| 2 | 1 | 17 | 90 | 45:01 | Humidifier Failure, Check water pressure | No water flow: check pump |
| 2 | 2 | 18 | 91 | 45:02 | No water flow. Check glycol pump. | Discharge temperature sensor problem |
| 2 | 3 | 19 | 92 | 45:03 | Smoke detected, located inside unit | High temperature warning |
| 2 | 4 | 20 | 93 | 45:04 | Fire Stat Tripped, Location inside unit | Low temperature warning |
| 2 | 5 | 21 | 94 | 45:05 | Standby pump on, check glycol pump | High humidity warning |
| 2 | 6 | 22 | 95 | 45:06 | Low voltage warning, check unit | Low humidity warning |
| 2 | 7 | 23 | 96 | 45:07 | Water detected in under floor area | Fan motor overload: check motor amperage |

| Byte | Bit | Relative Offset | Location in Data Array (Absolute Offset) Each alarm stored as a separate bit | Location in Data Array (Absolute Offset) Each set of 8 alarms stored as a byte* | 046, 048 and 049 Units | DAP 80 Units |
|---|---|---|---|---|---|---|
| 3 | 0 | 24 | 97 | 46:00 | Low air temperature warning | Local alarm #1: See tag inside door |
| 3 | 1 | 25 | 98 | 46:01 | High air temperature warning | Local alarm #2: See tag inside door |
| 3 | 2 | 26 | 99 | 46:02 | Low Humidity warning | Local alarm #3: See tag inside door |
| 3 | 3 | 27 | 100 | 46:03 | High Humidity warning | Local alarm #4: See tag inside door |
| 3 | 4 | 28 | 101 | 46:04 | Low chilled-water-in alarm | Standby pump on: check primary pump |
| 3 | 5 | 29 | 102 | 46:05 | High chilled-water-in alarm | UPS power on: check main power supply |
| 3 | 6 | 30 | 103 | 46:06 | Low chilled-water-out alarm | Custom message on optional input #1 |
| 3 | 7 | 31 | 104 | 46:07 | High chilled-water-out alarm | Custom message on optional input #2 |
| 4 | 0 | 32 | 105 | 47:00 | High or Low limits misadjusted | Custom message on optional input #3 |
| 4 | 1 | 33 | 106 | 47:01 | Air temperature sensor error | Custom message on optional input #4 |
| 4 | 2 | 34 | 107 | 47:02 | Humidity sensor error | Humidification Inhibited |
| 4 | 3 | 35 | 108 | 47:03 | Discharge air sensor error | Reheat inhibited |
| 4 | 4 | 36 | 109 | 47:04 | No communications with temp/humid module | Reheat and humidification inhibited |
| 4 | 5 | 37 | 110 | 47:05 | No communications with LCD module | Discharge air temperature limit (just a condition) |
| 4 | 6 | 38 | 111 | 47:06 | Alarm network communications failure | Reheat mode during dehumidification (just a condition) |
| 4 | 7 | 39 | 112 | 47:07 | AC Power or controller restart | Manual Override: Check bypass switches (DAPII ver 5.1 and later) |
| 5 | 0 | 40 | 113 | 48:00 | Network doppelganger error | N/A |
| 5 | 1 | 41 | 114 | 48:01 | Incompatible Fahrenheit / centigrade mode | N/A |
| 5 | 2 | 42 | 115 | 48:02 | Schedule normal maintenance due | N/A |
| 5 | 3 | 43 | 116 | 48:03 | compressor short cycle warning | N/A |
| 5 | 4 | 44 | 117 | 48:04 | Fan motor overload, check motor amperage | N/A |

| Byte | Bit | Relative Offset | Location in Data Array (Absolute Offset) Each alarm stored as a separate bit | Location in Data Array (Absolute Offset) Each set of 8 alarms stored as a byte* | 046, 048 and 049 Units | DAP 80 Units |
|------|-----|-----------------|------|------|------|------|
| 5 | 5 | 45 | 118 | 48:05 | Custom message on optional alarm input #1 | N/A |
| 5 | 6 | 46 | 119 | 48:06 | Custom message on optional alarm input #2 | N/A |
| 5 | 7 | 47 | 120 | 48:07 | Custom message on optional alarm input #3 | N/A |
| 6 | 0 | 48 | 121 | 49:00 | Discharge air temperature limit (just a condition) | N/A |
| 6 | 1 | 49 | 122 | 49:01 | Reheat mode during dehumidification (just a condition) | N/A |
| 6 | 2 | 50 | 123 | 49:02 | N/A | N/A |
| 6 | 3 | 51 | 124 | 49:03 | N/A | N/A |
| 6 | 4 | 52 | 125 | 49:04 | N/A | N/A |
| 6 | 5 | 53 | 126 | 49:05 | N/A | N/A |
| 6 | 6 | 54 | 127 | 49:06 | N/A | N/A |
| 6 | 7 | 55 | 128 | 49:07 | N/A | N/A |
|   |   |   |   | **Notes** |   |   |
|   |   |   |   | * | 43:00 Indicates array element zero. Individual alarm can be found by masking and looking at the zero'th bit of this element. |   |

## Chiller Stat Query

Unlike the Dap-Stat errors, these are stored in the Data Array using only one method – each error is stored at a separate location in the Data Array.

| Location in Data Array (Absolute Offset) Each alarm stored as a separate bit | Alarm / Bit Descriptions | Byte | Bit | Relative Offset |
|------|------|------|-----|------|
| 536 | Auxiliary cooling available | 0 | 0 | 0 |
| 537 | Auxiliary cooling locked out | 0 | 1 | 1 |
| 538 | Unit on backup module standby | 0 | 2 | 2 |
| 539 | Custom message on optional input #1 | 0 | 3 | 3 |
| 540 | Custom message on optional input #2 | 0 | 4 | 4 |
| 541 | Evaporator freeze stat module #1 | 0 | 5 | 5 |
| 542 | Evaporator freeze stat module #2 | 0 | 6 | 6 |
| 543 | Evaporator freeze stat module #3 | 0 | 7 | 7 |
| 544 | High pressure problem module #1 | 1 | 0 | 8 |
| 545 | High pressure problem module #2 | 1 | 1 | 9 |
| 546 | High pressure problem module #3 | 1 | 2 | 10 |
| 547 | High return temperature warning | 1 | 3 | 11 |
| 548 | High supply temperature warning | 1 | 4 | 12 |
| 549 | Local alarm #1: See tag inside door | 1 | 5 | 13 |

| Location in Data Array (Absolute Offset) Each alarm stored as a separate bit | Alarm / Bit Descriptions | Byte | Bit | Relative Offset |
|---|---|---|---|---|
| 550 | Local alarm #2: See tag inside door | 1 | 6 | 14 |
| 551 | Low pressure problem module #1 | 1 | 7 | 15 |
| 552 | Low pressure problem module #2 | 2 | 0 | 16 |
| 553 | Low pressure problem module #3 | 2 | 1 | 17 |
| 554 | Low return temperature warning | 2 | 2 | 18 |
| 555 | Low supply temperature warning | 2 | 3 | 19 |
| 556 | Low voltage warning: check unit | 2 | 4 | 20 |
| 557 | Scheduled normal maintenance due | 2 | 5 | 21 |
| 558 | Manual override: compressor | 2 | 6 | 22 |
| 559 | Manual override: check bypass switches | 2 | 7 | 23 |
| 560 | No chilled water flow module #1 | 3 | 0 | 24 |
| 561 | No chilled water flow module #2 | 3 | 1 | 25 |
| 562 | No chilled water flow module #3 | 3 | 2 | 26 |
| 563 | No condenser water flow | 3 | 3 | 27 |
| 564 | Power problem or restart | 3 | 4 | 28 |
| 565 | Return temperature sensor problem | 3 | 5 | 29 |
| 566 | compressor short cycle warning | 3 | 6 | 30 |
| 567 | Standby pump on: Check primary pump | 3 | 7 | 31 |
| 568 | Supply temperature sensor problem | 4 | 0 | 32 |
| 569 | Unit on total standby | 4 | 1 | 33 |
| 570 | Under floor water detected | 4 | 2 | 34 |
| 571 | N/A | 4 | 3 | 35 |
| 572 | N/A | 4 | 4 | 36 |
| 573 | N/A | 4 | 5 | 37 |
| 574 | N/A | 4 | 6 | 38 |
| 575 | N/A | 4 | 7 | 39 |
| 576 | N/A | 5 | 0 | 40 |
| 577 | N/A | 5 | 1 | 41 |
| 578 | N/A | 5 | 2 | 42 |
| 579 | N/A | 5 | 3 | 43 |
| 580 | N/A | 5 | 4 | 44 |
| 581 | N/A | 5 | 5 | 45 |
| 582 | N/A | 5 | 6 | 46 |
| 583 | N/A | 5 | 7 | 47 |

### *Appendix E.5.   Using DA_Assoc correctly with Writes/Toggling Values*

Association of Map Descriptors can result in zero's being written to the DAP device.  The following information can help to prevent this problem.  When Map Descriptors are associated using the same value for the DA_Assoc parameter then the associated Map Descriptors are all processed before a write is sent to the DAP unit.  A write to a DAP unit writes a complex set of data – it is not possible to write a single variable's value to a DAP device.  Each associated Map Descriptor is used to update the complex set of data that will be written.

Consider the following Map Descriptor fragments

| Data_Array, | Data_Array_Offset, | Function, | Node_Name, | Address | DA_Field, | DA_Assoc, | Scan_Interval |
|---|---|---|---|---|---|---|---|
| DA_SETPOINTS, | 0, | WRBC, | Unit1, | 0, | 1, | nom_h_setpt,, | 120s |
| DA_SETPOINTS, | 1, | passive, | Unit1, | 0, | 1, | t_setpt,, | 120s |

If an upstream device writes a value to DA_SETPOINTS Offset 0, when the write is done the values of DA_SETPOINTS Offset 0 AND Offset 1 are both used to build the complex data set since the Map Descriptors are associated.  If the upstream device has never set the value of DA_SETPOINTS offset 1, the value will be zero and hence a value of zero would be written to the DAP's Temperature Setpoint.

This could be avoided by not associating the Map Descriptors. This will, however, result in extra write messages being sent to the DAP device.  The extra messages could be avoided by changing the wrbc to a wrbx. If you do this you must still consider the effects of association and in this case it may be best to have each Map Descriptor defined as a wrbx with a different value for DA_Assoc.

## Appendix F. Write Through's

This driver provides very limited Write Through Support.

It is possible to generate a Write Through by writing to the Data Array used in a read Map Descriptor where the DA_Func keyword is 'Everything' provided that the write through results in Dap80-Menu command being sent to the DAP device. This is true for variables whose offsets are between 899 and 1086 in Section Appendix A.3

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