

TECHNICAL NOTE 8: ASSIGNING DNP VARIABLES TO AN EVENT CLASS

When the DNP property IPROP_DNP_EVENT_CLASS is true, the DNPPT references the DAC variable group field for the class of the variable. The following table illustrates how the user defines the event class for the variable in the group field.

Variable Class (stored in variable group field)	Description
0x00	Variable is assigned to the static class. This disables event generation for the variable
0x01	Variable is assigned to Class 1
0x02	Variable is assigned to Class 2
0x04	Variable is assigned to Class 3
0x11	Variable is assigned to Class 1, and is included in a umode response
0x12	Variable is assigned to Class 2, and is included in a umode response.
0x14	Variable is assigned to Class 2 and is included in a umode response.

When the user application reads events for a variable, the DNPPT provides the class information that it used to filter the variables in the DACENV.Group of the DACENV structure (when using DAC versions 2 or 3) or as an extra argument on the ReadEvents API (when using DAC version 1). The following table shows the possible filtering options.

Filter	Description
0x01	Return Class 1 changes
0x02	Return Class 2 changes
0x04	Return Class 3 changes
0x11	Return Class 1 umode changes
0x12	Return Class 2 umode changes
0x14	Return Class 3 umode changes

It is possible for the user application to determine if a variable should be returned on an event read by anding the filter key and the class assignment in the variable group field, as the following logic illustrates.

```

Filter = DACENV.Group (DAC Version 2 and 3)
If ( filter & Variables.Group ) == filter )
    Return the variable
    
```

Technical Note 8: Assigning DNP Variables to an Event Class

Else

Skip the variable.

The following table shows how the DNPPT sets up the class filter for various types of event reads.

Filter	Description
0x00	Binary Input Change Read (there is no class information specified in the request).
0x10	Binary Input Change Umode read.
0x01	Class 1 read
0x11	Umode Class 1 read.

The following table shows how the user application responds to various combinations of variable grouping and filter.

Variable Group	Filter	Filter & Group	Return the variable?
0x11	0x00	0x00	Yes, Read Binary Change
0x11	0x01	0x01	Yes, Class 1 Read
0x11	0x02	0x00	No, Class 2 Read
0x11	0x10	0x10	Yes, Umode Read Binary Change
0x11	0x11	0x11	Yes, Umode Read Class 1
0x11	0x12	0x10	No, Umode Read Class 2

Assigning Class

If `IPROP_DNP_EVENT_CLASS` is false, the DNPPT handles class assignment internally and does not notify the user application of any changes in class assignment. In this case, the DNPPT assumes that all variables for an object are assigned to the same class. The class assignment must be on an object basis, not a variable basis.

If `IPROP_DNP_EVENT_CLASS` is true, the DNPPT allows individual variables to be assigned to any DNP class; the DNPPT passes the class assignment to the user application. The user application assigns class using the variable group field. The user can use the property `IPROP_DACPNT_GROUP` to read and write the group field. The user sets the group field to one of the values specified in the table at the beginning of this technical note.

Note that DAC version 1.7x does not support a group field. In compatibility mode, the DNPPT uses `ObjSet` and `ObjGet` with the attribute `DAC_OBJATT_EVENT_CLASS` to read and write the class of a DNP variable. The DNPPT reads the variable's class prior to changing it, to preserve the setting of the Umode enable/disable flag.

Technical Note 8: Assigning DNP Variables to an Event Class

The user can make the class assignments statically (configured when the system starts up). In this case, the DNP Assign Class Function is not required to initialize the settings. If the group field is zeroed, this disables event reporting for the variable. The DNPPT cannot detect or read events inserted into the event queue with a class of zero.

Enabling and Disabling Umode

Enabling and disabling Umode works like assigning class: It depends on the same properties used in class assignment. The umode enabled/disabled flag is embedded in the variable's class. Class is preserved by reading the class assignment of the variable, setting or clearing the umode flag, and writing the class assignment back. The user application can configure the umode flag when the system initializes. The DNPPT uses the umode enable/disable flag only if the DNP umode property is set true. The DNPPT transmits user events unsolicited only for variables that have their umode flags enabled.