



Product Type: *Controllers* Concurrent NTCIP Port Operation

Reference: AN2051
Date: March 16, 2007

Overview

The ASC/3 controller supports concurrent NTCIP communication on more than one port. Message types include GETs, SETs, and Remote Commands. All messages are processed on a first come, first serve basis.

However, extreme care must be taken to ensure that data is not corrupted by ports setting data from more than one source. Remote commands should be coordinated between multiple sources to eliminate any possible conflicts in intended operation. Timing and priority parameters are provided to manage the preferences.

Multiple Port/Message Combinations

Given two active ports, A & B, the following combinations are possible:

| | | |
|-----|-----|---|
| GET | GET | OK |
| GET | CMD | OK |
| CMD | GET | OK |
| SET | GET | OK |
| GET | SET | OK |
| CMD | CMD | The Commands sent on the Port with the Higher Priority will be executed. |
| SET | SET | Must be monitored carefully by the multiple sources. |
| SET | CMD | Possibility of Data versus Command conflict if modified data relates to Remote Command. Unexpected controller operation may result. |
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Remote Commands

The ASC/3 controller supports Remote Command operation via NTCIP commands. These messages instruct the controller to run a particular coordination pattern, or apply specific phase calls. Phase omits, holds, and force-offs may also be sent. In order to avoid conflicts with multiple NTCIP sources, the ASC/3 implements a security method using three configurable elements:

1. NTCIP-defined unitBackupTime object (MM-1-5-1)
2. ECPIP-defined Port Priority assignments (MM-1-5-1)
3. ECPIP-defined Drop-out time, assigned per port (MM-1-5-2, 3, 4)



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The controller resets the Backup Timer every time one of the Remote Commands (as defined in NTCIP 1202, section 2.4.3) is sent an NTCIP SET-message. However, the Drop-Out Timer resets any time any message is received on its respective port, regardless of the message's protocol or intent.

Only Remote Command received on the "Active Command Port" will be honored by the controller. The ASC/3 selects the Active Command Port by checking the priorities assigned to those ports on which packets have been received. If only one port is active, then that port, by default, becomes the Active Command Port. However, if another port is also receiving data, then the controller will set the Active Command Port to the one with the higher priority.

Please note that all Remote Commands (from the current Active Command Port) will be cleared whenever the Active Command Port changes. This may occur for two reasons:

1. The current Active Command Port times out its Backup Timer or its Drop Out Timer
2. Another *higher priority* port has begun communicating with the controller.

Remote Commands will never conflict with GETs from other ports. Nor will there be a conflict with multiple ports sending Commands due to the method described above in selecting the Active Command Port.

However, in rare cases, Remote Commands may conflict with SET messages from another (lower priority) port. This would only occur if the Remote Command had selected a particular coordination pattern to be run and the SET modified the data *used in that pattern*. If the sources of the two ports knowingly did this, then there would be no problem BUT if the SET port had no knowledge of the Remote Command Port's activity, unexpected controller operation could occur.

SET Commands

Concurrent SET commands have the highest possibility of creating unexpected behavior in the controller. Currently, no mechanism exists to deny any particular port access to modifying the database. It is essential that multiple NTCIP sources coordinate their SET messages such that one source does not overwrite the data required by another source.