OptoControl and HostWords protocol specifics in UniOP implementation

Table of contents

1. Introduction 2
2. Setting up the Opto 22 hardware 3
3. OptoControl Strategy 4
3.1. Adding support for UniOP's Reserved Data Area 4
3.2. Enhanced Mode Alarms support 4
3.3 Adding HostWords to an OptoControl strategy 4
3.4 Limitations 5
3.41. String length 5
4 OptoControl vs. HostWords 6

1. Introduction

This document describes procedures for preparing Opto 22 controllers to work with UniOP.

2. Setting up the Opto 22 hardware

In order to enable the communication with UniOP an Opto22 controller should be configured to match following parameters:

Parameter	Setting
Communication mode	Binary mode
Baud rate	maximum Baud rate: 38400 Bd
Controller address	Any (1-255)
Host port	Any port that supports RS-232

Connect the UniOP-Opto22 communication cable to the port on the controller configured as Host port.

3. OptoControl Strategy

3.1. Adding support for UniOP's Reserved Data Area

In order to use Reserved Data Area (RDA) additional Integer Table has to be added to the strategy used on the Opto 22 controller connected to UniOP.

The table should have following parameters:

- The size of the table should be minimum 19 elements (see the note below).
- The name of the table is not important.
- Table should be initialized to 0 (zero).
- Choosing whether table initialization is performed 'on strategy run' or 'on strategy download' is left to user (depends whether user wants to preserve some data in the table or not)

To find out more about Reserved Data Area (RDA) and how to us it to interact with UniOP, see UniOP document "UniOP Reserved Data Areas", UNI068-x.DOC.

NOTE: The actual size of the table depends on what parts of RDA are enabled in Designer. Given size of 19 elements covers the maximum possible size of RDA. To calculate the needed table size, divide the RDA size in bytes by 4 and round the result to first higher integer value.

3.2. Enhanced Mode Alarms support

In order to use Enhanced Mode Alarms additional Integer Table has to be added to the strategy used on the Opto 22 controller connected to UniOP. This table is simmilar to the Integer Table used for RDA (see previous paragraph). The same table as for RDA can be used but the starting index should be set not to interfere with RDA data.

The table should have following parameters:

- The table should be big enough to hold all the alarms (see the note below).
- The name of the table is not important.
- Table should be initialized to 0 (zero).
- Choosing whether table initialization is performed 'on strategy run' or 'on strategy download' is left to user (depends whether user wants to preserve some data in the table or not)

NOTE: To calculate the needed table size, divide the total number of defined alarms by 32 and round the result to first higher integer value.

3.3 Adding HostWords to an OptoControl strategy

HostWords is a set of commands that allow easy access to information on Opto controllers from other machines such is UniOP. This method of communications to an Opto controller is recommended by

manufacturer because it is designed to be supported as a common interface for future controller releases.
You need to have the file HOSTWORD.CTL in order to support HostWords.
As far as we know, HOSTWORD.CTL is distributed with all new FactoryFloor packages (above Release 1.0 - no HostWords are shipped with Release 1.0). It can also be ordered from the Opto 22 manufacturer.

The file HOSTWORD.CTL must be downloaded to the Opto 22 controller prior to trying to utilize any of the HostWords commands.

The simplest way to achieve this is as follows:

1. Copy HOSTWORD.CTL to your OptoControl project subdirectory, but any directroy will work.
2. Run OptoControl.
3. Go to the "Configure Mode".
4. Select the "Configure" menu.
5. Select the "Controllers" option on this menu. This will display the "Configure Controllers" dialog.
6. Select the controller of interest and then select the "Download Options". This will display the "Download Options" dialog for this controller.
7. In the "After Run File" section select the "Add" button.
8. Browse for HOSTWORD.CTL file, select it, and select the "OK" button on all remaining open dialogs.

Now on each subsequent download of this strategy to the selected controller, HOSTWORD.CTL will be downloaded too.

3.4 Limitations

3.41. String length

Due to internal communication message length limit in UniOP, the maximum length of strings (read from Opto 22 controller) displayed on UniOP, is limited to 60 characters. The eventual remaining characters are ignored by UniOP.
Also all strings written to controller by UniOP are limited to 60 characters from the same reason. In this case the string variable in Opto 22 controller will, once written by UniOP, contain only the characters written by UniOP.

4 OptoControl vs. HostWords

UniOP can communicate with Opto 22 controllers using one of the two supported protocols. These protocols are called OptoControl and HostWords.

The **OptoControl** protocol is a superset of standard FORTH commands ('words') implemented on Opto22 controllers. It is automatically supported by all controllers. There is no need to download the support for it. The only drawback is that manufacturer does not guaranty not to change either syntax or behavior of these commands.

The **HostWords** protocol is a superset of OptoControl words that allows simplified access to information on Opto22 controllers. It is the recommended method of communications to an Opto controller because it is designed to be supported as a common interface for future controller releases. The drawback here is that HostWords has to be downloaded to a controller. There is no default support for it. Downloading HostWords can significantly increase total download time of a strategy.

HostWords is actually written using OptoControl words.
It provides additional parameter checking - if some I/O unit's feature (counter, totalizer, etc.) on a controller is not defined the error will be returned. Such checking is not performed with OptoControl protocol.
The direct consequence of this is that some fields successfully accessed using OptoControl protocol may become unaccessible when protocol mode is changed to HostWords protocol. This simply means that the I/O unit (or point) does not have the feature either enabled or supported.

Although Opto 22 manufacturer recommends HostWords protocol, the decision whether to use OptoControl or HostWords is left up to user.