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Synchronizer Users Manual

by

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1. Introduction

This is a Simulink (xPC Target) program to pick up a MTS trigger signal off of the SCRAMNet and then output the trigger via DIO lines as a TTL signal, to various DAQ devices. It also outputs a TTL clock to DAQ devices, based off the 1024 Hz MTS SCRAMNet interrupt at location 94.

2. Requirements

This application is written using Matlab and Simulink. It has been developed and tested using R13, but should work with future versions. The target OS is xPC target. Both the host and target must be setup to run this code.

The target should be running xPC with the following hardware:

- SCRAMNet SC150+
- NI PCI 6031E A/D Card

3. Installation

The Synchronizer application may be downloaded from:

<http://nees.buffalo.edu/software/Synchronizer/>

1. Unzip the distribution.

4. Configuration

Edit the file *trigger_config.m* to configure the trigger source (STS, Table 1, or Table 2), what data acquisition devices to trigger and what rate to output the external clocks. Below is a sample configuration file with a description of configuration options.

```
% Trigger source
% 1 - STS
% 2 - Table 1
% 3 - Table 2
triggerSource = 2;

% Trigger destinations
% 0 - Do not trigger device
% 1 - Trigger device
triggerPacific = 1;
triggerKrypton = 0;
triggerCepoint = 1;
triggerOther = 0;

% Output clock rates
% 2^n Hz, where n <= 10
sampleRatePacific = 256;
sampleRateKrypton = 128;
sampleRateCepoint = 32;
sampleRateOther = 1;
```

These DIO channels are for each devices trigger and clock signals:

Table 1: DIO Connections

DIO Channel	Destination
0	Pacific trigger
1	Krypton trigger
2	Cepoint trigger
3	Other trigger
4	Pacific clock
5	Krypton clock
6	Cepoint clock
7	Other clock

5. Running

Open Matlab and set your current directory to this distribution directory. Run:

```
>> start
```

and the Simulink program will build, download to the xPC Target, and start executing.

6. Status

The top scope will display the trigger status of the data acquisition devices. They will be either high (1) or low (0) depending on the type of triggering and the currently value of the selected MTS trigger.

The bottom scope will display the external clocks for the data acquisition devices.

7. Stopping

Type:

```
>> stop
```

and the Simulink application should stop executing on the xPC Target.

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10. License

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