Ascension Flock of Birds
dtkConfigService

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Overview

As of dtk-2.4.18, DIVERSE has added support for the Ascension Flock of Birds tracking system. The name of the dtkConfigService DSO for the Flock of Birds is fob.so and will reside in the etc/dtk/serviceDSO directory under the DTK_ROOT directory.

The flock of birds may contain a single standalone bird which has a sensor and a transmitter which should have its address set to 0 or it may contain multiple birds with the first bird's address set to 1 and consecutive addresses for each additional bird. If an ERC is attached to the flock it should be set at address 1 as the master bird. Some of the configuration options will require a sensorID which corresponds to the address of the bird to which the sensor is attached.

Environment Variables

The DTK_SERVICE_CONFIG_PATH environment variable has been added which tells the dtk-server or dtk-loadService commands where to find configuration files.

Usage

The fob dtkConfigService must be loaded through a configuration file passed directly to the dtk-server or using the dtk-loadService command. Both the dtk-server and dtk-loadService commands have been updated to load configuration files. The configuration files can be used to load dtkService or dtkConfigService DSOs, though only dtkConfigService DSOs are able to accept additional options. If additional options are passed to a dtkService DSO an error will occur.

If the configuration file you wish to load is in another directory you can either pass the full path to the file or specify where the dtk-server or dtk-loadService commands should search for the file using the DTK_SERVICE_CONFIG_PATH environment variable.

Often it is desirable to run the dtk-server as a daemon. If you load a configuration file and an error occurs during loading it is recommended that you shut down the dtk-server and start it without daemonization and with the verbose option set.

dtk-server -v

If you wish to load the configuration file immediately you can do so using

dtk-server -c flock.config -v

To load the configuration file while the dtk-server is already running, use the dtk-loadService command as

dtk-loadService -c flock.config

If any errors occur a useful message should appear stating why the error occurred.

Configuration

To define a service within a configuration file use the serviceType definition. This defines the name to use for the dtkService and which dtkService or dtkConfigService DSO to load.

Syntax: serviceType name DSOname
Example: serviceType flock fob

where name is an arbitrary name used to link serviceOptions with the correct service and DSOname is the name of a dtkService or dtkConfigService DSO.

Within a configuration file, options may be passed to dtkConfigService DSOs. An error will occur if options are passed to a regular dtkService or non-dtkConfigService DSO. Use the serviceOption definition to specify options to be passed to a dtkConfigService DSO. The serviceOption requires a name and at least one additional parameter which should be valid for the that DSO.

Syntax: serviceOption name option ...
Example serviceOption flock myOption param1 param2

Below is a list of acceptable options for the fob service.

> Note: boolean values can be “yes”, “no”, “on”, “off”, “true”, or “false”.
> Note: The sensorID should be an integer representing the address of the bird.

port

The trackdType serviceOption requires a single value following the trackd parameter. The value should identify the port to which the device is attached (i.e. /dev/ttyS0, com1, etc)

Syntax: serviceOption name port portname
Example: serviceOption flock port /dev/ttyS0

where name was defined with the serviceType definition, and portname is a valid device file.

baud

The baud serviceOption requires a single value following the baud parameter. The value passed should be a valid baud rate.

Syntax: serviceOption name baud rate
Example: serviceOption flock baud 38400

where name was defined with the serviceType definition, and rate is a valid baud rate.

trackd

The trackd option specifies whether to write data to dtkVRCOSharedMem (a simple trackd emulation provided by DIVERSE).

Syntax: serviceOption name trackd boolean
Example: serviceOption flock trackd yes

where name was defined with the serviceType definition, and boolean specifies whether to enable or disable the feature.

calibration

The calibration serviceOption requires that the name of a dtkCalibration DSO follow along with any parameters which will be passed to the dtkCalibration DSO initCalibration function.

Syntax: serviceOption name calibration DSOname ...
Example: serviceOption flock calibration /home/patrick/fobcalibration/fobcalibration.so -c /home/patrick/fobcalibration/calibration.dat

trackdtype (KEYS NOT CURRENTLY IMPLEMENTED BUT TYPE IS)

The trackdtype parmeter is used to specify the shm type and key for any sensors that you desire to use trackd emulation.

Syntax: serviceOption name trackdType sensorID type shmKey
Example: serviceOption flock trackdType2 tracker 4126

where name was defined with the serviceType definition, sensorID is the bird address of the sensor, type is either "tracker" or "controller", and shmKey is the System V shared memory key to use.

hemisphere

The hemisphere option specifies the hemisphere of the transmitter in which tracking should be based

Syntax: serviceOption name hemisphere direction
Example: serviceOption flock hemisphere upper

where name was defined with the serviceType definition, and direction is one of "forward", "rear", "upper","lower", "left", or "right".

metal

The metal option specifies if metal error detection is enabled. If enabled the metal error value will be passed to a dtkCalibration DSO loaded for this service. It is up to the author of any calibration service to handle metal error detection if they wish to do so. Otherwise the metal error is not used.

Syntax: serviceOption name metal sensorID boolean\n"
Example: serviceOption flock metal 2 on

where name was defined with the serviceType definition, sensorID is the bird address of the sensor to set the metal option, and boolean specifies whetherto enable or disable the feature.

metalSensitivity

The metalSensitivity specifies the metal sensitivity to use for metal error detection.

Syntax: serviceOption name metal_sensitivity sensorID value
Example: serviceOption flock metal_sensitivity 2 20

where name was defined with the serviceType definition, sensorID is the bird address of

the sensor to set the metal sensitivity option, and value is a number between 0 and 127 representing the sensitivity.

metalOffset

The metalOffset specifies teh offsetto be used for metal error detection.

Syntax: serviceOption name metal_offset sensorID value
Example: serviceOption flock metal_offset 2 20

where name was defined with the serviceType definition, sensorID is the bird address of the sensor to set the metal offset option, and value is a number between 0 and 127 representing the offset.

metalSlope

The metalSlope specifies the slope to be used for metal error detection.

Syntax: serviceOption name metal_slope sensorID value
Example: serviceOption flock metal_slope 2 20

where name was defined with the serviceType definition, sensorID is the bird address of the sensor to set the metal slope option, and value is a number between 0 and 127 representing the slope.

metalAlpha

The metal_alpha option specifies the alpha value to be used for metal error detection.

Syntax: serviceOption name metal_alpha sensorID value
Example: serviceOption flock metal_alpha 2 20

where name was defined with the serviceType definition, sensorID is the bird address of the sensor to set the metal alpha option, and value is a number between 0 and 127 representing the alpha.

sensorOffset

The sensorOffset option is used to specify the offset of the output sensor location relative to its real location.

Syntax: serviceOption name sensorOffset sensorID X Y Z
Example: serviceOption flock sensorOffset 21.2 0.3 -0.6

where name was defined with the serviceType definition, sensorID is the bird address of the sensor to set, and X, Y, and Z are measured in inches.

sensorRotation

The sensorRotation option is used to specify the rotation of the sensor relative to the transmitter.

Syntax: serviceOption name sensorRotation sensorID H P R
Example: serviceOption flock sensorRotation 3 -90.0 21.5 15.0

where name was defined with the serviceType definition, sensorID is the bird address of the sensor to set, and H is the heading, P is the pitch, and R is the roll measured in degrees.

transmitterOffset

The transmitter offset option is used to specify the offset from the transmitter to the origin.

Syntax: serviceOption name transmitterOffset X Y Z
Example: serviceOption flock transmitterOffset 2.1 -35.0 14.3\n"

where name was defined with the serviceType definition, and X, Y, and Z are measured in inches.

transmitterRotation

The transmitterRotation option is used to specify the rotation of the axes about the origin relative to the transmitter.

Syntax: serviceOption name transmitterRotation H P R
Example: serviceOption flock transmitterRotation 12.0 30.0 -20.5

where name was defined with the serviceType definition, and H is the heading, P is the pitch, and R is the roll measured in degrees.

dataMode (NOT YET IMPLEMENTED)

The datamode option specifies the type of data to be output by the flock of birds for a particular sensor.

Syntax: serviceOption name datamode sensorID mode
Example: serviceOption flock datamode 2 positionangles

where name was defined with the serviceType definition, sensorID is the bird address of the sensor to set and mode is one of the following values: "angles", "matrix", "quaternion", "position", "positionangles", "positionmatrix", or "positionquaternion".

angleUnits

The angleUnits option specifies whether the angle data is output as degrees or radians.

Syntax: serviceOption name angles sensorID (degrees | radians)
Example: serviceOption flock angles 2 angles

where name was defined with the serviceType definition, sensorID is the bird address of the sensor to set, and the unit type is set to either "degrees" or "radians". The default value for angle units is "degrees".

dtkShm

The dtkShm option specifies the name of the dtkSharedMem segment to be created and used for data output.

Syntax: serviceOption name dtkShm sensorID shmName
Example: serviceOption flock dtkShm 2 head

where name was defined with the serviceType definition, sensorID is the bird address of the sensor to set and shmName is a valid name for a file.

srtScaleExpand

The srtScaleExpand option specifies whether to expand the scale factor used to compute the position of the sensor relative to the transmitter for short range transmitters (SRT). This option is ignored when using an extended range transmitter (ERT).

Syntax: serviceOption name srtScaleExpand boolean
Example: serviceOption srtScaleExpand on

where name was defined with the serviceType definition, and boolean specifies whether to enable or disable the feature.

transmitter

The transmitter option specifies which transmitter to use.

Syntax serviceOption name transmitter sensorID transmitterNumber
Example: serviceOption name transmitter 1 0

where name was defined with the serviceType definition, sensorID is the bird address of the sensor to set, and transmitterNumber is the transmitter number of the transmitter on the bird. For an ERC the transmitter number can be in the range 0 - 3. For a standard range transmitter attached to a bird, the transmitter number must be 0. If the transmitter number is omitted, the transmitter number will be set to 0.

axisMap

The axisMap option specifies the orientation of each axis.

Syntax: serviceOption name axisMap orientX orientY orientZ
Example: serviceOption flock axisMap -y -x +z

where name was defined with the serviceType definition, and orientX, orientY, and orientZ are "-x", "+x", "-y", "+y", "-z", "+z".

diverseUnit

The diverseUnit option is used to specify the valuefor the DIVERSE unit in meters.

Syntax: serviceOption name diverseUnit units
Example: serviceOption diverseUnit 1.524

where name was defined with the serviceType definition, and units are the diverse unit size in meters.