ING TECHNICAL SPECIFICATION

DATA ACQUISITION SYSTEM INTERFACE

VERSION 00.00 **DATE** 970801 **AUTHOR**

1. **INTRODUCTION**

1.0 **Purpose of document**.
This document defines a logical, electrical, and functional interface standard for the ING telescopes that enables the seamless integration of detector controller subsystems to the common telescope data acquisition system (DJ). By establishing this interface, all developers of detector controller (CCDC) hardware and software who wish to use the ING DJ system are presented with a clear and concise definition of the capabilities of the system and the methods of using these capabilities.

1.1 **Document version control**.
The responsibility of document control is placed with the ING Software Group who are responsible for the strict change and version control of it. The generalized aim of version control is to assure that increasing minor version number changes will assure compatibility to all lower versions with the same major version number. The major version number will be used to designate a generalized area of use (e.g. autoguiders, science ccd's, photon counters, etc.) or be used to indicate incompatibility with prior releases when compatibility cannot be achieved. It is recommended that the major version numbers between 90 and 99 be reserved for development and experimental use only. It would be most productive if version number compliance can be indicated in CCDC and DJ software version numbering. The ING Software Group also have the responsibilty to provide interpretation of the document contents.

1.2 **Scope of the document**.

1.3 **Who should read it and use it**.
Anyone involved with the development and use of detector controllers for use on instrumentation supported by the ING. The ING provides a large portion of the infrastructure required to support observations on the telescopes, therefore, anyone who wants to make their instrument ***work reliably*** within that infrastructure is required to read and understand this document. Please refer to the ING Software Group for an interpretation of any specific wording in this document.

2. TECHNICAL REQUIREMENTS OF INTERFACE.

2.0 **Logical requirements**.

DETECTOR CONTROLLER IDENTIFICATION
- PHYSICAL TYPE OF CONTROLLER
- TYPE OF SERVICE
- ADDRESSING AND SELECTION OF CONTROLLER
- SCOPE AND VISIBILITY OF ADDRESS, SELECTION, IDENTIFICATION

DETECTOR IDENTIFICATION
- PHYSICAL DETECTOR TYPE
- DETECTOR READOUT MODE (SEQUENCER CODE) REQUIREMENTS
- DETECTOR ENVIROMENT (BIAS VOLTAGES, TEMPERATURE, ETC.) REQUIREMENTS

IMAGE DATA CHANNEL IDENTIFICATION
- STORAGE REQUIREMENTS
- POST ACQUISITION PROCESSING REQUIEMENTS

2.1 **Functional requirements**.

The acquisition of an astronomical image involves the following processes:-
- detector stabalization
- detector reset
- shutter control
- image integration timing
- detector readout
- analog to digital conversion
- image data transfer
- post acquisition processes on image data
- collection of image descriptors
- formatting of image data and descriptors
- storage of formatted image file
- serving of image file to requesting clients
- error recovery
- syncronization of acquisition processes

The functional requirements and the distribution of the processes involved in acquiring an electronic image and storing it with sufficient detail of how it was acquired can be clasified in the following way.

FUNCTIONAL CLASIFICATION	DATA ACQUISITION PROCESSES	SUB SYSTEM RESPONSIBLE
DETECTOR CONTROL	detector stabalization	detector controller
	detector reset	detector controller
	detector readout	detector controller
	analog to digital conversion	detector controller
IMAGE INTEGRATION CONTROL	shutter control	detector controller
	integration timing	detector controller
	preflash timing	detector controller
IMAGE DATA TRANSFER CONTROL	image data transmission	detector controller
	image data reception	Data Junction
	image data error checking	Data Junction
POST ACQUISITION PROCESSING	image stitching	Data Junction
	image data normalization	Data Junction
	image data stacking	Data Junction
IMAGE DESCRIPTOR COLLECTION	detector descriptors	Data Junction
	timing descriptors	Data Junction
	instrument descriptors	Data Junction
	telescope descriptors	Data Junction
	misc descriptors (eg. meteology)	Data Junction
FORMAT AND STORAGE CONTROL	formatting	Data Junction
	storage	Data Junction
IMAGE SERVING	client request processing	Data Junction
	image transmission	Data Junction
ERROR RECOVERY	recovery of control	Data Junction
	recovery of data	Data Junction
SYNCRONIZATION CONTROL	state mapping	Data Junction
	status collection	Data Junction

2.2 **Physical requirements**.

2.3 **Capacity requirements**.