Name: GID DesignModel
Author: Dr Hlaszny, Edit | Szilassy, Bertalan
Version: 1-001
Created: 2017. 07. 16. 0:00:00
Updated: 2017. 07. 16. 22:52:41

Generic Infection Detector (GID)
Design Model | Table of Content

GID Entity Relationships

The **Entity Relationship Model** is composed of entity types (which classifythe things of interest) and specify relationships that can exist between instnces of those entity types.

GID High Level Model

The **High Level Design Model** defines the whole environment of the Generic Infection Detector: Its interfaces, and the collaborating functional block.

GID Low Level Model

The **Low Level Design Model** shows the internal structure of the Generic Infection Detector, with repetition of its interfaces and gives detailed functional descriptions of its components.

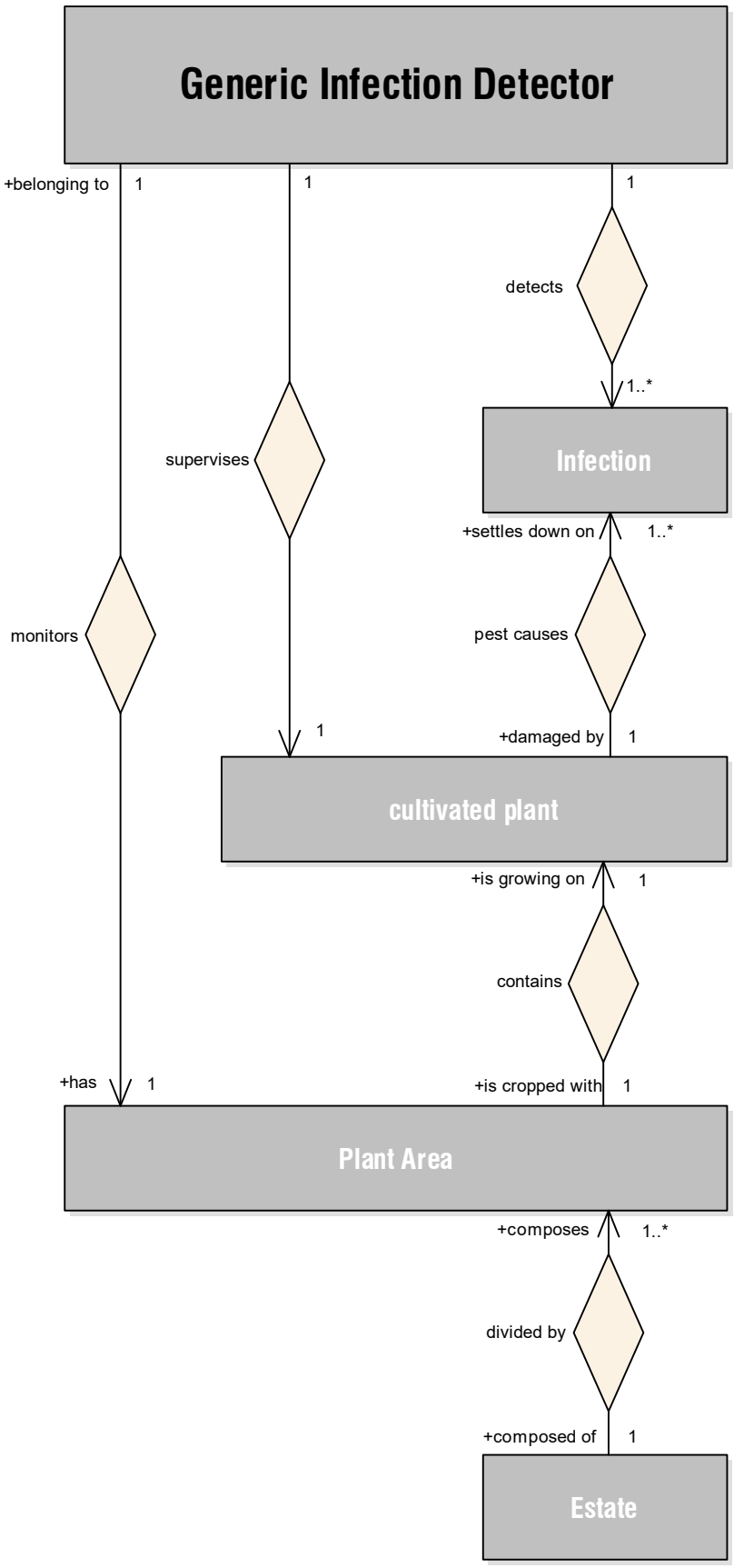
Review Status: internally reviewed
Reviewed by: 2017/07/23
Harangozo, Balint | Szilassy, Bertalan

Blank Parts

Elaborated Parts

Name: GID Entity Relationships
Author: Dr Hlaszny, Edit | Szilassy, Bertalan
Version: 1-001
Created: 2017. 07. 15. 0:00:00
Updated: 2017. 07. 16. 19:42:02

Generic Infection Detector (GID)
Entity Relationships



The **Generic Infection Detector** detects several infection on the same plant

The **Infection** is the process by which pathogens establish contact with susceptible cells or tissues of the host and procure nutrients from them.

The particular variety of the **Cultivated Plant** is growing on a plant are

The **Plant Area** is a continuous piece of agricultural land, on that one particular variety of cultivated plant is produced

The **Estate** is a larger agricultural land divided into one or more plant areas

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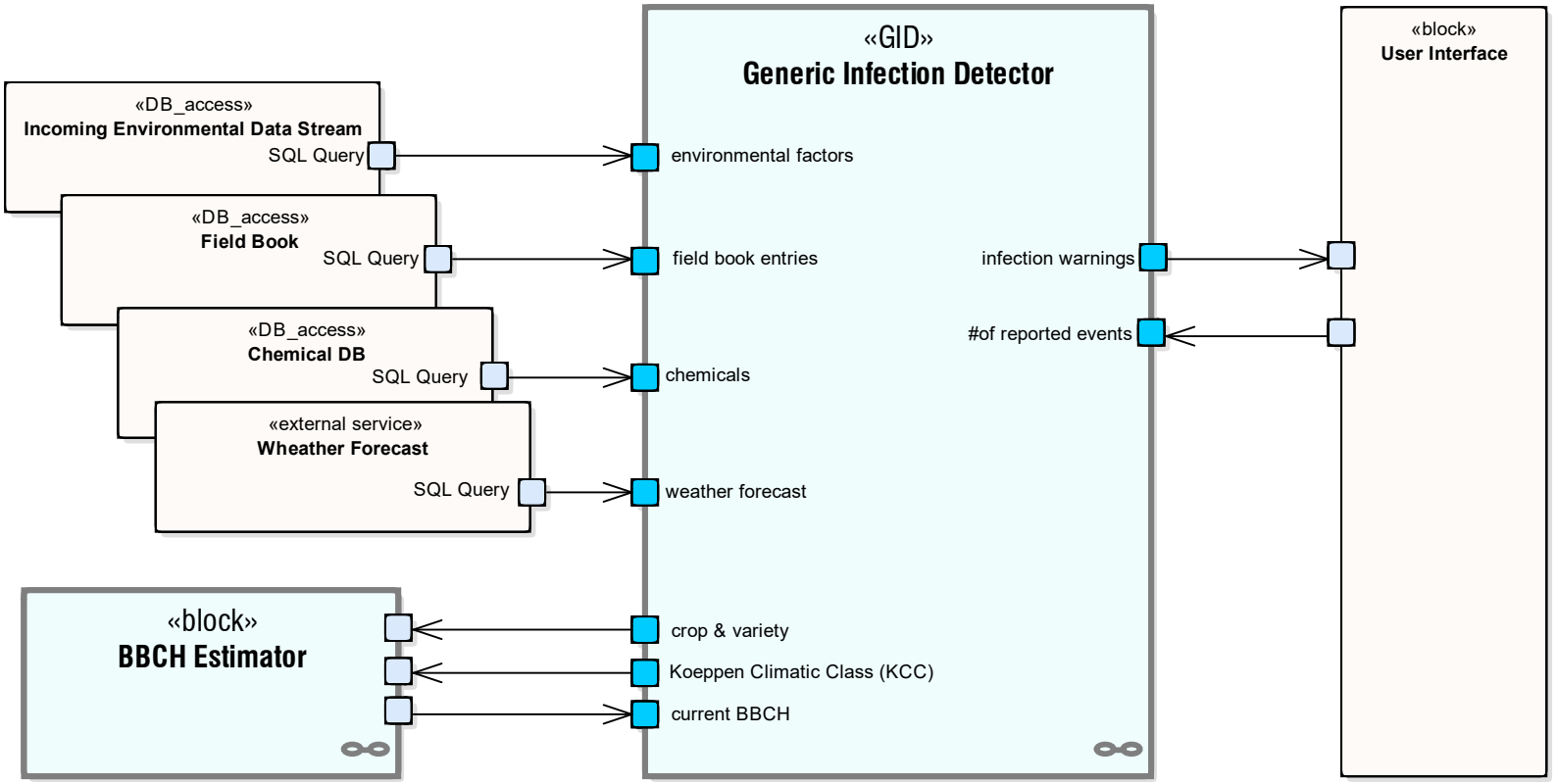
Harangozo, Balint | Szilassy, Bertalan

Name: GID_HighLevelModel
Author: Dr Hlaszny, Edit
Version: 1-001
Created: 2017. 07. 02. 0:00:00
Updated: 2017. 07. 16. 20:38:42

Generic Infection Detector (GID)
Internal Structure



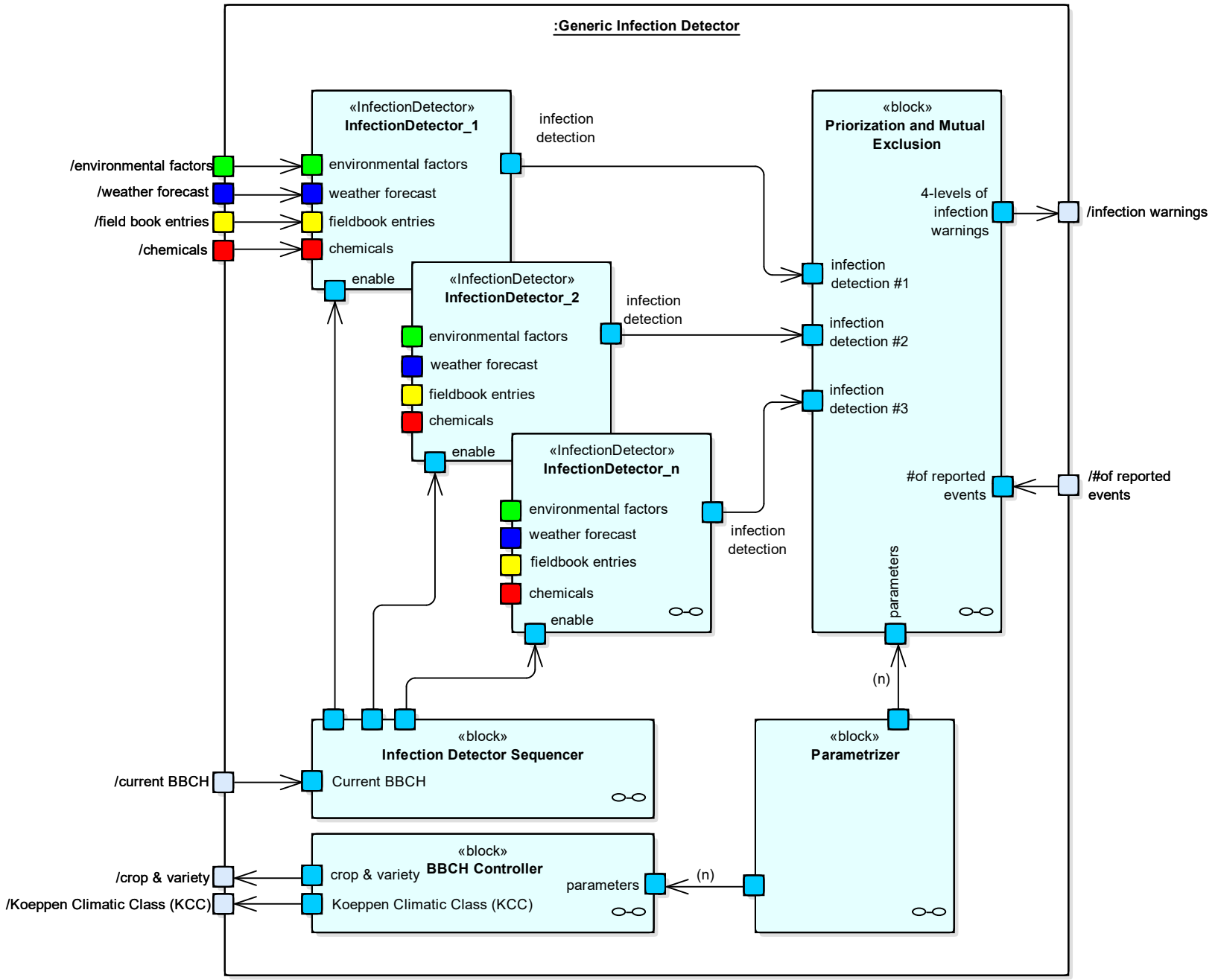
Review Status: internally reviewed
Reviewed by: 2017/07/23
Harangozo, Balint | Szilassy, Bertalan

Blank Parts
Elaborated Parts

Name: GID_LowLevelModel
Author: Dr Hlaszny, Edit
Version: 1-001
Created: 2017. 07. 03. 0:00:00
Updated: 2017. 07. 16. 22:44:37

Generic Infection Detector (GID)
Internal Structure

back to the Design Model
back to the High Level Design Model



Review Status: internally reviewed

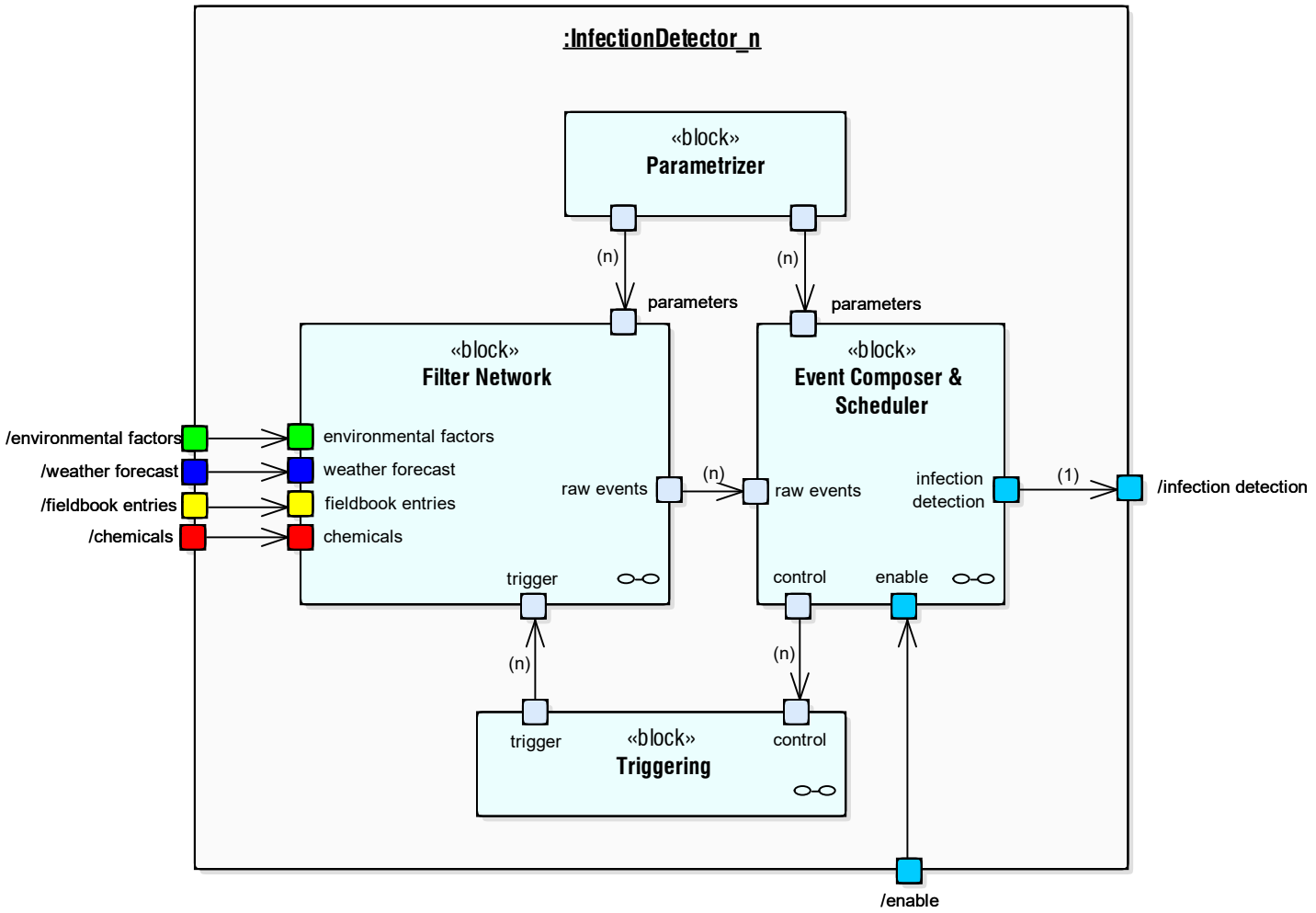
Reviewed by: 2017/07/23
Harangozo, Balint | Szilassy, Bertalan

Blank Parts

Elaborated Parts

Name: Infection Detector
Author: dr.Hlaszny, Edit
Version: 1-001
Created: 2017. 07. 03. 11:36:12
Updated: 2017. 07. 16. 22:49:41

Infection Detector
Internal Structure



Review Status: internally reviewed

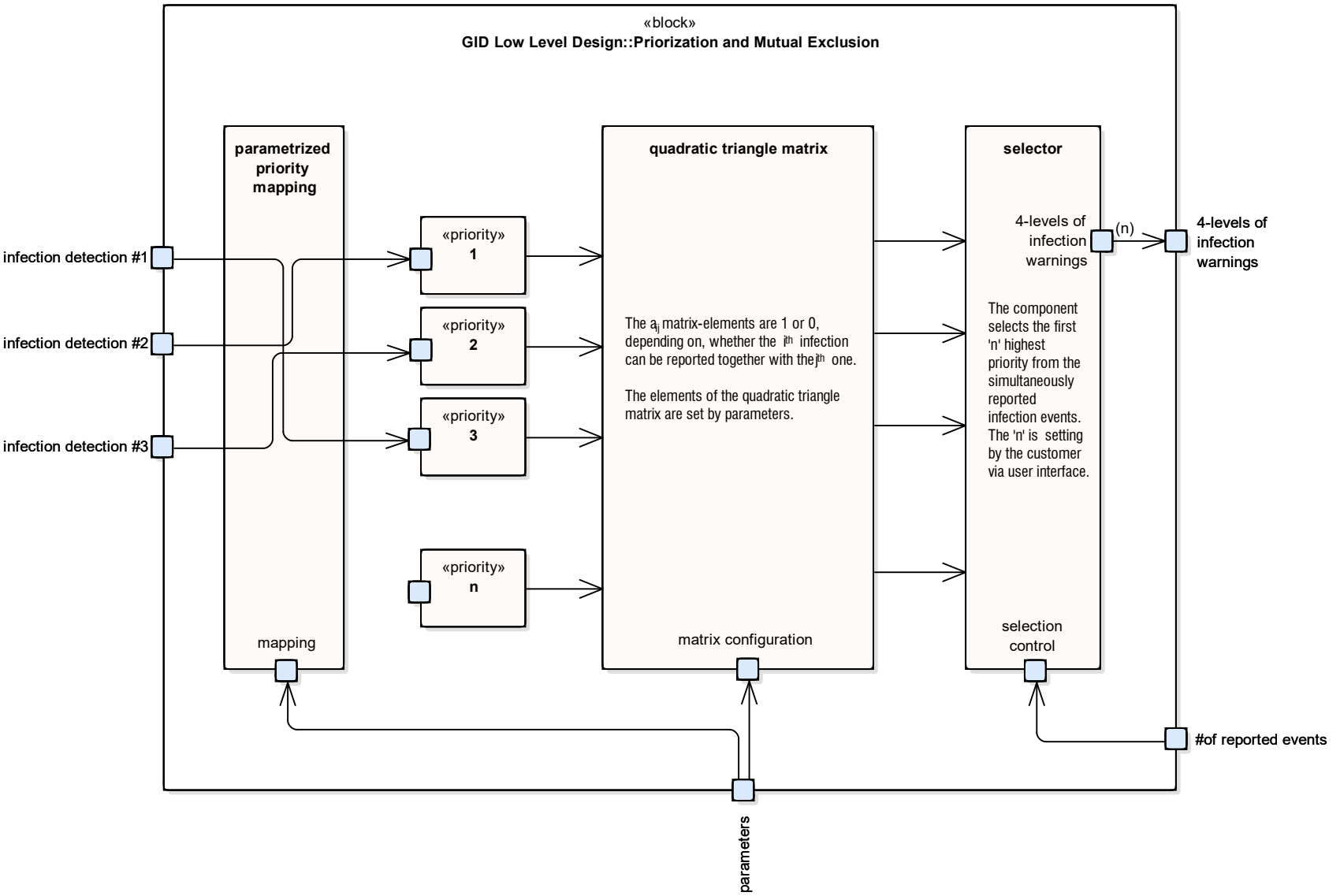
Reviewed by: 2017/07/23
Harangozo, Balint | Szilassy, Bertalan

Blank Parts

Elaborated Parts

Name: Priorization and Mutual Exclusion
Author: Dr Hlaszny, Edit | Szilassy, Bertalan
Version: 1-001
Created: 2017. 07. 12. 0:00:00
Updated: 2017. 07. 17. 23:40:02

Infection Detector
Priorization and Mutual Exclusion



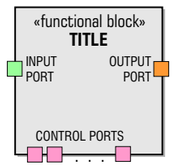
Review Status: internally reviewed
Reviewed by: 2017/07/23
Harangozo, Balint | Szilassy, Bertalan

Blank Parts
Elaborated Parts

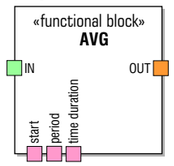
PlantCT™ System

Infection Detector (GID) | Plasmopara Viticola 2ndary Infection

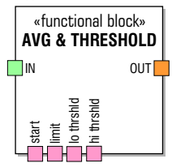
Box and Port Semantics



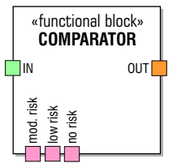
The AVG block computes an average value from its input sequence. PERIOD defines the repetition time of the sequence's elements, DURATION defines the time duration of the average computing.



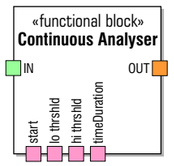
The AVG & THRESHOLDS block is almost identical with the AVG one, the only one exception is that only those values are taken into consideration, which are between the two (upper and lower) thresholds.



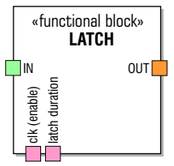
The COMPARATOR block classifies (compares) the infection's indicator variable according to its control values (thresholds for NO RISK, LOW RISK, and MODERATED RISK).



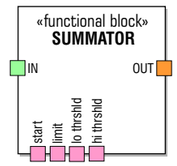
The CONTINUOUS ANALYSER gives the longest time interval between 'just now' and 'timeDuration' in the past, where the input value did not cross the lower and upper thresholds.



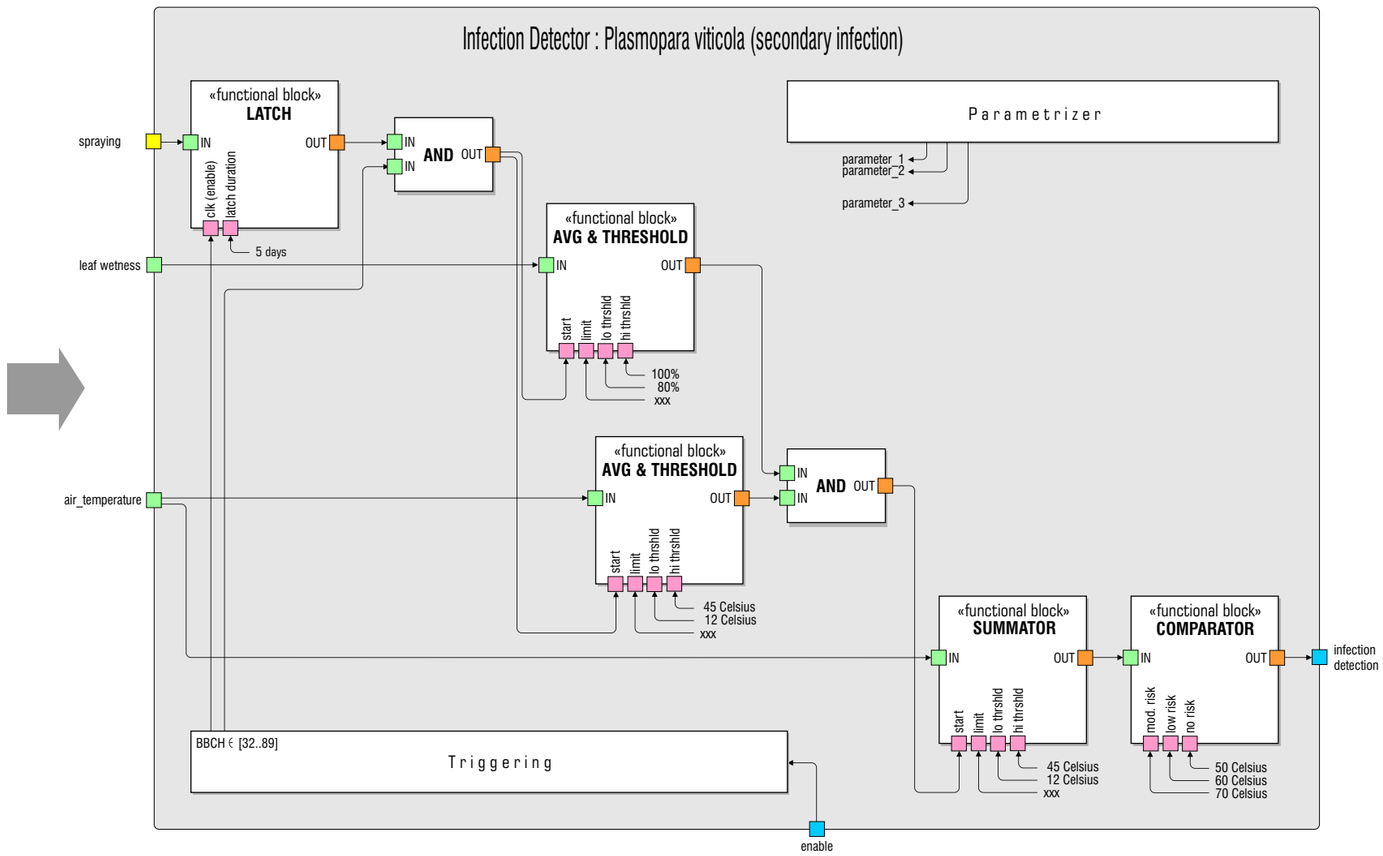
The LATCH block provides a sample and hold functionality: it 'latches' the input value and holds it till the latching duration control parameter defines.



The SUMMATOR block summarizes the values of the incoming environmental factors (no constant sampling frequency is used, each different value will be summarized) if it is between the upper and the lower threshold.




```
PROCESSING STEPS:

    LET  lower_leaf_wetness_threshold      80 % ;
    LET  lower_air_temperature_threshold   12 Celsius Grad ;

    INITIALIZING:
        //  Initializing variables to be able to
        //  collect the cumulated wet heatsum
        LET  cumulated_wet_heatsum  = 0 ;

    START_OF_REPETITION

        IF ((date_of_previous_spraying - current_date) > 5 days)
        THEN
            GO_TO INITIALIZING
        END-IF

        //  Computation regarding sporulation and infection
        LET  idx                = 1 ;
        LET  daily_wet_heatsum  = 0 ;

        FOR (idx  IS RUNNING ONE BY ONE TO  24)

            IF (avg_hourly_leaf_wetness[idx] >
                lower_leaf_wetness_threshold)
            THEN
                IF (avg_hourly_air_temperature[idx] >
                    lower_air_temperature_threshold)
                THEN
                    LET  hourly_wet_heatsum_increase  =
                           (avg_hourly_air_temperature[idx]   -
                            lower_air_temperature_threshold) ;

                    LET  daily_wet_heatsum  = daily_wet_heatsum +
                         hourly_wet_heatsum_increase ;
                END-ID
            END-IF
        END-FOR

        LET  cumulated_wet_heatsum  = cumulated_wet_heatsum +
                                      daily_wet_heatsum ;
        SWITCH (cumulated_wet_heatsum)

            CASE          cumulated_wet_heatsum < 50
                  MESSAGE_TO_THE_CUSTOMER "No risk of infection" ;

            CASE   50 <=  cumulated_wet_heatsum  < 60
                  MESSAGE_TO_THE_CUSTOMER "Low risk of infection" ;

            CASE   60 <=  cumulated_wet_heatsum  < 70
                  MESSAGE_TO_THE_CUSTOMER "Moderate risk of infection" ;

            CASE   70 <=  cumulated_wet_heatsum
                  MESSAGE_TO_THE_CUSTOMER "High risk of infection" ;
        END-SWITCH

        //  this BBCH value means berries ripe for harvest,
        //  so no secondary infection is possible
        IF (BBCH >= 89 )
        THEN
            BREAK_FROM_REPETITION ;
        END-IF

    END_OF_REPETITION
```



 V 1-001 2017/09/16

Dr Hlaszny, Edit +36 30 311 6516 edit.hlaszny.dr@quantislabs.com
Szilassy, Bertalan +36 20 9 414151 bertalan.szilassy@quantislabs.com