<document classification>

openETCS Types for Defining API Inputs and Outputs (from executable model point of view)

Draft for Discussion. API designed for 3rd iteration

**Summary:**

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**Reference:** openETCS Modeling (WP3)  
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<summary>

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# General Project Description

This modul provides interface definitions for messages defined via the openETCS API.  
  
- Name: API\_Types.etp  
- Description: openETCS Architecture and Desing Document  
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- Gist URL: ---  
- Cryptography: No  
- Athor(s): Bernd Hekele  
  
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THEREFORE, NO LIABILITY WILL BE GIVEN FOR SUCH AND ANY OTHER KIND OF USE.

# Software Architecture

## Project Architecture

This section displays the package hierarchy of projects.

Project [APITypes](#LinkM-APITypes)  
 [API\_Msg\_Pkg](#LinkS-!ed/b88d/1CD8/1D0C/546ca1bf57d3)  
 [API\_TIU\_Pkg](#LinkS-!ed/b824/3EFC/133C/54b531897f46)  
 [TIU\_Types\_Pkg](#LinkS-!ed/10ec5/4587/1C64/548456684f7e)

# APITypes Project

## API\_Msg\_Pkg Package

### Types

Table 1: Public Types of API\_Msg\_Pkg

| Name | Definition | Comments and Information |
| --- | --- | --- |
| API\_addInfo\_T | {listLinking : BG\_Types\_Pkg::LinkedBGs\_T} | **Comments:**  packet information received via telegram **listLinking Comments:**  Linking information received via packet 5. Information is of variable length. |
| API\_Telegram\_T | {present : bool, checkResult : bool, api\_bad\_balise\_received : bool, api\_header : BG\_Types\_Pkg::TelegramHeader\_T, api\_packets : API\_Msg\_Pkg::API\_addInfo\_T, centerOfBalisePosition : BG\_Types\_Pkg::centerOfBalisePosition\_T} | **Comments:**  Telegram as received via the API. This type has to be defined in the openETCS API **present Comments:**  Indicates the presence of new and valid information at the start of the routine **checkResult Comments:**  reports the result of the decoding procedure.  true: successfully decoded  false: errors during decoding. Typically, this is the result of the check of the parameters of the telegram. **api\_bad\_balise\_received Comments:**  inicates, whether a bad balise has been received. In this scenario, dta are not valid. **api\_header Comments:**  Telegram\_Header **api\_packets Comments:**  Packets received with this balise **centerOfBalisePosition Comments:**  actual odometry of where the telegram has been received |

## API\_TIU\_Pkg Package

### Types

Table 2: Public Types of API\_TIU\_Pkg

| Name | Definition | Comments and Information |
| --- | --- | --- |
| TIU\_input\_msg | {valid : bool, info : TIU\_Types\_Pkg::Message\_Train\_Interface\_to\_EVC\_T} | **valid Comments:**  Information is valid (true = present) **info Comments:**  Information for the TIU information. Follows API Functional data dictionary |

## TIU\_Types\_Pkg Package

### Types

Table 3: Public Types of TIU\_Types\_Pkg

| Name | Definition | Comments and Information |
| --- | --- | --- |
| A\_nothing\_to\_resume\_profile\_follow\_T | TIU\_Types\_Pkg::nothing\_to\_resume\_profile\_follow\_T ^32 |  |
| Brake\_command\_T | {m\_servicebrake\_cm : TIU\_Types\_Pkg::M\_brake\_signal\_command\_T, m\_emergencybrake\_cm : TIU\_Types\_Pkg::M\_brake\_signal\_command\_T} |  |
| Brake\_inhibition\_command\_T | {m\_regenerativebrake\_cm : TIU\_Types\_Pkg::M\_brake\_inhibit\_command\_T, m\_eddycurrentbrake\_cm : TIU\_Types\_Pkg::M\_eddy\_current\_brake\_inhibition\_T, m\_magneticshoebrake\_cm : TIU\_Types\_Pkg::M\_brake\_inhibit\_command\_T} |  |
| Brake\_status\_T | {m\_regenerativebrake\_st : TIU\_Types\_Pkg::M\_brake\_status\_T, m\_eddycurrentbrake\_st : TIU\_Types\_Pkg::M\_brake\_status\_T, m\_magneticshoebrake\_st : TIU\_Types\_Pkg::M\_brake\_status\_T, m\_electropneumaticbrake\_st : TIU\_Types\_Pkg::M\_brake\_status\_T, m\_additionalbrake\_st : TIU\_Types\_Pkg::M\_brake\_status\_T} |  |
| cabActiveStatus\_T | enum {cabNone\_Active, cabA\_Active, cabB\_Active} | **Comments:**  Indicates which cab is activated **cabNone\_Active Comments:**  No CAB selected **cabA\_Active Comments:**  CAB A is activated **cabB\_Active Comments:**  CAB B is activated |
| Change\_of\_allowed\_current\_consumption\_T | {d\_test\_current : TIU\_Types\_Pkg::D\_test\_current\_T, m\_current : TIU\_Types\_Pkg::M\_current\_T} |  |
| D\_test\_current\_T | TIU\_Types\_Pkg::D\_test\_distance\_T |  |
| D\_test\_distance\_T | {now : int, distance : int} |  |
| D\_test\_trackcond\_T | TIU\_Types\_Pkg::D\_test\_distance\_T |  |
| D\_test\_trackinit\_T | TIU\_Types\_Pkg::D\_test\_distance\_T |  |
| D\_test\_traction\_T | TIU\_Types\_Pkg::D\_test\_distance\_T |  |
| L\_test\_trackcond\_T | TIU\_Types\_Pkg::D\_test\_distance\_T |  |
| M\_airtightness\_command\_T | enum {tunnel\_condition\_active, tunnel\_condition\_not\_active} |  |
| M\_brake\_inhibit\_command\_T | enum {inhibit\_brake, do\_not\_inhibit\_brake} |  |
| M\_brake\_signal\_command\_T | enum {apply\_brake, release\_brake} |  |
| M\_brake\_status\_T | enum {is\_active, is\_not\_active} |  |
| M\_cab\_signal\_status\_T | enum {both\_desks\_are\_closed, desk\_A\_is\_open, desk\_B\_is\_open, both\_desks\_are\_open} |  |
| M\_change\_traction\_system\_T | {d\_test\_traction : TIU\_Types\_Pkg::D\_test\_traction\_T, m\_voltage : TIU\_Types\_Pkg::M\_voltage\_T} |  |
| M\_current\_T | {no\_restriction : bool, restriction : int} |  |
| M\_directioncontroller\_signal\_status\_T | enum {direction\_controller\_in\_neutral, direction\_controller\_in\_forward, direction\_controller\_in\_backward} |  |
| M\_eddy\_current\_brake\_inhibition\_T | enum {inhibit\_for\_service\_brake, inhibit\_for\_emergency\_brake, inhibit\_for\_both\_service\_emergency\_brake, do\_not\_inhibit\_for\_service\_brake, do\_not\_inhibit\_for\_emergency\_brake, do\_not\_inhibit\_for\_both\_service\_emergency\_brake} |  |
| M\_Isolation\_status\_T | enum {on\_board\_equipment\_is\_isolated, on\_board\_equipement\_is\_not\_isolated} |  |
| M\_mainpowerswitch\_command\_T | enum {open\_main\_power\_swicth, close\_main\_power\_switch} |  |
| M\_nonleading\_signal\_status\_T | enum {M03\_info\_not\_available, non\_leading\_permitted, non\_leading\_not\_permitted} |  |
| M\_pantograph\_command\_T | enum {lower\_pantograph, raise\_pantograph} |  |
| M\_passiveshunting\_signal\_status\_T | enum {passive\_shunting\_permitted, passive\_shunting\_not\_permitted} |  |
| M\_sleeping\_signal\_status\_T | enum {signal\_active, signal\_not\_active} |  |
| M\_trackcond\_T | enum {non\_stopping\_area, tunnel\_stopping\_area, sound\_horn, powerless\_section\_lower\_pantograph, radio\_hole, air\_tightness, switch\_off\_regenerative\_brake, switch\_off\_eddy\_current\_brake\_for\_service\_brake, switch\_off\_magnetic\_shoe\_brake, powerless\_section\_switch\_off\_main\_power\_switch, switch\_off\_eddy\_current\_brake\_for\_emergency\_brake} |  |
| M\_traction\_cutoff\_command\_T | enum {apply\_traction\_cutoff, release\_traction\_cutoff} |  |
| M\_traction\_signal\_status\_T | enum {traction\_on, traction\_off} |  |
| M\_train\_data\_entry\_type\_T | enum {fixed\_entry\_type, flexible\_entry\_type, switchable\_entry\_type} |  |
| M\_train\_data\_info\_T | int |  |
| M\_trainintegrity\_signal\_status\_T | enum {train\_is\_not\_integer, train\_is\_integer} |  |
| M\_voltage\_T | {voltage\_type : TIU\_Types\_Pkg::M\_voltage\_types\_T, NID\_ctraction : TIU\_Types\_Pkg::NID\_ctraction\_T} |  |
| M\_voltage\_types\_T | enum {line\_not\_fitted\_with\_any\_traction\_system, ac\_25kV\_50Hz, ac\_15kV\_16\_7Hz, dc\_3kV, dc\_1\_5kV, dc\_600\_750kV} |  |
| Message\_EVC\_to\_Train\_Interface\_T | {isolation\_status : TIU\_Types\_Pkg::M\_Isolation\_status\_T, brake\_command : TIU\_Types\_Pkg::Brake\_command\_T, brake\_inhibition : TIU\_Types\_Pkg::Brake\_inhibition\_command\_T, type\_I\_train\_commands : TIU\_Types\_Pkg::Type\_I\_train\_commands\_T, change\_traction\_system : TIU\_Types\_Pkg::M\_change\_traction\_system\_T, passenger\_door\_control\_info : TIU\_Types\_Pkg::Passenger\_door\_control\_info\_T, change\_of\_allowed\_current\_consumption : TIU\_Types\_Pkg::Change\_of\_allowed\_current\_consumption\_T} |  |
| Message\_Train\_Interface\_to\_EVC\_T | {train\_status : TIU\_Types\_Pkg::Mode\_control\_and\_train\_status\_T, brake\_status : TIU\_Types\_Pkg::Brake\_status\_T, brake\_pressure : TIU\_Types\_Pkg::P01\_brake\_pressure\_value\_T, train\_data\_entry\_type : TIU\_Types\_Pkg::M\_train\_data\_entry\_type\_T, train\_data\_info : TIU\_Types\_Pkg::M\_train\_data\_info\_T, type\_I\_train\_and\_brake\_inhibition : TIU\_Types\_Pkg::Type\_I\_train\_and\_brake\_inhibition\_with\_distance\_commands\_T} |  |
| Mode\_control\_and\_train\_status\_T | {m\_sleeping\_st : TIU\_Types\_Pkg::M\_sleeping\_signal\_status\_T, m\_passiveshunting\_st : TIU\_Types\_Pkg::M\_passiveshunting\_signal\_status\_T, m\_nonleading\_st : TIU\_Types\_Pkg::M\_nonleading\_signal\_status\_T, m\_cab\_st : TIU\_Types\_Pkg::M\_cab\_signal\_status\_T, m\_directioncontroller\_st : TIU\_Types\_Pkg::M\_directioncontroller\_signal\_status\_T, m\_trainintegrity\_st : TIU\_Types\_Pkg::M\_trainintegrity\_signal\_status\_T, m\_traction\_st : TIU\_Types\_Pkg::M\_traction\_signal\_status\_T} |  |
| NID\_ctraction\_T | int |  |
| nothing\_to\_resume\_profile\_follow\_T | {d\_test\_trackcond : TIU\_Types\_Pkg::D\_test\_trackcond\_T, l\_test\_trackcond : TIU\_Types\_Pkg::L\_test\_trackcond\_T, m\_trackcond : TIU\_Types\_Pkg::M\_trackcond\_T} |  |
| P01\_brake\_pressure\_value\_T | {valid : bool, pressure : int} |  |
| Passenger\_door\_control\_info\_T | int |  |
| S\_nothing\_to\_resume\_profile\_follow\_T | {nIter : int, value : TIU\_Types\_Pkg::A\_nothing\_to\_resume\_profile\_follow\_T} |  |
| trainData\_T | {validData : bool, RecExit : bool, cabActiveStatus : TIU\_Types\_Pkg::cabActiveStatus\_T} | **Comments:**  Components describing the Train **validData Comments:**  Train Data are valid (linked to SRS 4.8.4 remark [4] **RecExit Comments:**  SRS 4.8.4 remark [1]: for level 2/3:  only if following the reception of the information “Recognition of Exit from TR mode” with a more recent time stamp; for level 1: rejected **cabActiveStatus Comments:**  Indicates which cab is activated |
| Type\_I\_train\_and\_brake\_inhibition\_with\_distance\_commands\_T | {nothing\_to\_resume\_profile\_follow : TIU\_Types\_Pkg::nothing\_to\_resume\_profile\_follow\_T, empty\_profile\_initial\_state\_to\_be\_resumed : TIU\_Types\_Pkg::D\_test\_trackinit\_T} |  |
| Type\_I\_train\_commands\_T | {m\_pantograph\_cm : TIU\_Types\_Pkg::M\_pantograph\_command\_T, m\_airtightness\_cm : TIU\_Types\_Pkg::M\_airtightness\_command\_T, m\_mainpowerswitch\_cm : TIU\_Types\_Pkg::M\_mainpowerswitch\_command\_T, m\_traction\_cutoff\_cm : TIU\_Types\_Pkg::M\_traction\_cutoff\_command\_T} |  |

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