In the year 2018 Ingeteam started supplying more than 200 control systems for toilet modules to a spanish toilet module manufacturer.

These systems were installed in Alstom USA High Speed Trains.

The INGESYS IC2 control unit not only is in charge of control different elements that compose a toilet (door control, water tanks, taps, hand dryer,....), also supplies a Web Application for maintenance functionalities and performs the communications with the VCU by CIP protocol.

The CIP protocol and Web Application comply with specifications and requirements to be integrated on Alstom´s communication net.

In February of 2018, Ingeteam passed the certification tests of the CIP protocol (Common Industrial Protocol) integrated in its INGESYS.

**Toilet module control solution**

**Applications:**
Toilet Module Control Solution for Rolling Stock.

## ALSTOM    TOI01    Ingeteam

**Admin tools:**

- Parameters
- Software update

**Maintenance tools:**

- Version
- Status Info
- Tests on demand
- History
- Operating data
- Device maint.
- Logout

### DEVICE MAINTENANCE
**Toilet module**

| Passenger facilities |
| SOS buttons status |
| Toilet temperature management |

**Water supply** [X]

Water pressure sensor   8.50 bar

○ Water pump relay
○ Intermediate tank level sensor
○ Water heater enabled
○ Drainage EV
○ Ejector drainage EV

| Air pressure | 8.5 bar |
| Toilet temperature | 8.5 ºC |
| Water pressure | 8.5 bar |

Toilet module healthy

| Parameter adjustement | Wear of devices |

| Tank status | Door system | WC System |

Ingeteam Web Server

www.ingeteam.com
ingesys.info@ingeteam.com

**Ingeteam**

| Hardware |
|---|
| 24Vdc Power Supply CPU |
| 1xCAN Open |
| 24x Digital Inputs |
| 28x Digital Outputs |
| 2xNTC |
| 6x Analog Inputs (V/I) |
| 1 Door Control Module |

| Software |
|---|
| CIP communication Protocol, Alstom Profile |
| SW application according to Toilet manufacturer's specification |

| | Standards |
|---|---|
| | EN 50121-3-2:2016 |
| **Immunity and Emission** | |
| **Temperature Range** | EN 50155:2017 [OT4 (-40ºC +70ºC)] |
| **Vibrations** | EN 50155:2017 [Body Mounted, Class B] / IEC 61373:2010 |
| **Fire protection** | EN 45545-2 |

INGESYS IC2 Toilet Module Controller

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*Ingeteam*