



## HUe

High-performance head unit for Saitel DR

Saitel DR is Schneider Electric's platform for simple real-time automation and control applications.

It is the lightest member of the Saitel family, consisting of advanced devices that offer a solid platform to integrate communications and applications for substation automation control systems with several references around the world.

Saitel DR's high-performance head unit module (HUe) offers the following features.

### High capacity

Thanks to the use of Saitel Baseline Platform and its modern processing hardware, the HUe module offers strong performance metrics for substation automation applications. Saitel Baseline software runs on a robust & secure operating system based on the LinuxRT kernel with the hardware offering USB 2.0 (host) & SD interfaces to expand file storage up to 32 GB.

### Cyber-security

HUe is built around a Sitara ARM processor with an integrated security engine (SEC 3.3.2). This is a hardware module optimised to process all the algorithms associated to SSL/TLS and it can perform single-pass cryptographic security processing for SSL & TLS.

The software infrastructure complies with the latest editions of IEC62351 & IEC62443, supporting natively a hardened infrastructure, embedded firewall, secured interfaces, centralised RBAC and Logging.

### IEC61850 standard

Based on the latest versions of the IEC61850 standard for the automation of electrical substations, the HUe module supports robust & flexible integration in IEC61850 ed.1 & ed.2 networks.

A novel configuration plugin for Easergy Builder simplifies the mapping of the IEC61850 data models to the data handled internally by the Saitel software.



### Compatible with Saitel Baseline Software

The HUe module has been designed to be fully compatible with the Saitel Baseline Software platform, leveraging Schneider Electric's experience in field installations, communications protocols and proven interoperability with other systems.

### Communications

HUe improves the communications capabilities of Saitel DR by offering 3x Ethernet, 1x RS485, 2x R232. Two of the Ethernet interfaces can be configured to support PRP, HSR and options to work with copper or fibre-optic interfaces.

### Synchronisation

HUe can synchronize and be synchronised from different sources:

- GPS
- IRIG-B 200-04 standard codes 002, 003, 006 & 007
- Support for de IEEE ® 1588 PTP for synchronisation over an Ethernet network
- Tele control protocols supporting synchronization messaging (DNP3, IEC101/4)

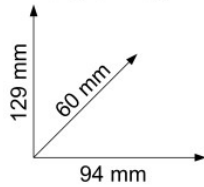
## HUe – High-performance head unit

Hardware Specifications	
Microprocessor	TI Sitara AM335x
Clock speed	600 MHz
Architecture	ARM – 32 bits
FLASH storage (NOR)	32 MB
FLASH storage (NAND)	256 MB
Static RAM	2 MB.
RAM backup mechanism	Super capacitor
Dynamic RAM (DDR3)	256 MB.
RTC	High precision, drift < ±3.5 ppm from -40 to +85 °C
Security Engine	SEC 3.3.2 (XOR acceleration)
Supported cryptographic algorithms	3DES, AES, MD5/SHA, RSA/ECC, & FIPS (determinist generator)
Cryptographic Processing	Single pass encryption
Security protocols	SSL & SRTP
Console (CON)	USB console
RS-485 port	Asynchronous isolated RS-485 – max. 38.400bps
COM1 port	Asynchronous non-isolated RS-232 – max. 115.200 bps (GPS connect.)
COM2 port	Asynchronous non-isolated RS-232 – max. 115.200 bps
LAN1 & LAN2	Copper 10/100BaseT with auto negotiation & PRP/HSR. Options: <ul style="list-style-type: none"> <li>Copper: RJ45 connector</li> <li>Fibre Optic: 100Base-FX.</li> </ul>
MNT	Copper 10/100BaseT with auto negotiation
USB storage port	2.0 (Host)
SD storage	SD card interface up to 32 GB
Comms with Saitel DR acquisition blocks	CAN bus
Comms with AB_SER expansion modules	Via 1 Mbps internal bus
Maximum number of AB_SER modules	4
CON port connection	Mini USB (type C)
COM1 & COM2 port connection	DB9
RS-485 port connection	3-way Terminal – 3,81 mm2 pitch
LAN1 & LAN2 ports <ul style="list-style-type: none"> <li>100BaseFX (Multimode, distance &lt; 2 km at full-duplex)</li> </ul>	RJ45 or LC-Duplex for SFP modules (not supplied). Recommended; <ul style="list-style-type: none"> <li>HFBR 57E0APZ (M.B.: 500MHz per km @ 1300 nm)</li> </ul>
MNT port	RJ45 connector
Module power Supply voltage	24/48 V <sub>DC</sub>
Voltage operating range	± 20%
Typical power consumption	6 W
Size – Dimensions	135 x 129 x 60 mm.
Weight	300 g
Software specifications	
Operating System	Linux-RT
Cyber-security features	Centralised RBAC, Event logging & encryption (IEC62351 & IEC62443)
Synchronization interfaces	GPS on COM1 / PTP1588 on ETH1&2 / SNTP (1ms) / IRIG-B
IRIG-B support	Standard 200-04 (codes 002, 003, 006 & 007)
Sequence of events resolution discrimination	1 ms
Watchdog	Hardware & software watchdog
Environmental specifications	
Operating temperature range	-40 °C to +70 °C
Moisture	95%
Tropicalization	Standard or Custom varnish. (ordering options)
Protection degree (module).	IP 20
Protection degree (cubicle).	IP 54 (typical)

## AB\_DI – 16 Digital Inputs



**Power supply:** Internal bus.  
**Typical consumption:** 0.55 W.  
**Weight:** 420 g.



**AB\_DI M555 x 0 0 0 0 y zz**

**DI Pol (Ax):**

- 2: 12 – 24 V<sub>DC</sub>
- 3: 48 – 60 V<sub>DC</sub>
- 4: 125 V<sub>DC</sub>
- 5: 220 V<sub>DC</sub>

**Revision:**  
(Revision code)

**Coating:**

- 0: Without coating
- 2: AVR80 coating (by ABchimie)

### Hardware Features

- Inputs: 16.
- Maximum number of counter inputs: 16.
- Inputs per common: 4.
- Polarization voltage (PV): 12-24 / 48 / 125 / 220 VDC (depending on the ordering options).
- Input current per signal: < 5.5 mA at polarization voltage (PV).
- Nominal value at level "1": From 80% to 120% PV.
- Nominal value at level "0": From 0 to 30% PV.
- Polarization range: From 80% to 120% PV.
- Polarization blocks isolation: Through optocoupler 2.5 kV<sub>RMS</sub>.
- Field connection:
  - 2 screw terminals 2.5 mm<sup>2</sup> / 13 AWG (digital inputs).

### Software Features

- Input type: Simple / Double / Slow counter.
- Processing of digital inputs:
  - Status indications (simple and double).
  - Memorized indications.
  - 32-bit pulse counters, 45 Hz (single or double edge).
- Timestamp: 1 ms.
- Filtering time: 0 – 255 ms.
- Settling time : 0 – 25500 ms.
- Change memory: 0 – 2550 ms.
- Anti-chattering window: 0 – 255 s.
- Number of events for chattering: 1 – 255 changes.

### Environmental Conditions

- Operating temperature range: From -40° to 70° C.
- Humidity limit of 95%.
- Coating: AVR80 coating (for more information, please consult [www.abchimie.com](http://www.abchimie.com)).
- Protection level: IP 20.

## AB\_DI – 16 Digital Inputs

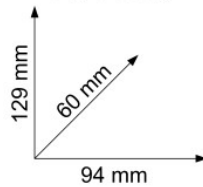
### Standard Compliance

<b>CE Mark</b>	According to the European Directive of Low Voltage 2006/95/CE and the Electromagnetic Compatibility Directive (EMC) 2004/108/CE.	
<b>EMC</b>	Electrostatic discharge immunity. Radiated, RF, EM field immunity. EM immunity, fast transient burst. EM immunity, surge. EM immunity, RF in common mode. EM immunity, magnetic field. EM emission, radiated emission. EM emission, conducted emission.	EN 61000-4-2, by contact $\pm 6$ kV (Level 3). EN 61000-4-3, between 80 and 2700 MHz (Level 3). EN 61000-4-4, power supply: $\pm 2$ kV, communication: $\pm 1$ kV (Level 3). EN 61000-4-5, power supply: $\pm 2$ kV symmetric and asymmetric (Level 3). EN 61000-4-6 (Level 3). EN 61000-4-8, 30 A/m at 50 Hz (Level 4). EN 55022, from 30 to 1000 MHz (Class A). EN 55022, from 0.15 to 30 MHz (Class A).
<b>Electric Safety</b>	General requirements (IEC 60950-1). Insulation and dielectric rigidity (IEC 60255-5).	Meets all the requirements indicated in the normative. Isolation $>100 \text{ M}\Omega$ , 2 kVAC.
<b>Environmental</b>	Cold test (UNE-EN 60068-2-1). Dry heat test (IEC 60068-2-2). Bump test (IEC 60068-2-29). (Vertical axis)  Random vibration test (UNE-EN 60068-2-64). (3 axes)	$-40^\circ \text{ C}$ during 16 h (from cold start). $+70^\circ \text{ C}$ during 16 h. Acceleration: $250 \text{ m/s}^2$ . Pulse duration: 6 ms. Number of shocks: 100 shocks/axis/polarity. Range: From 10 Hz to 500 Hz. Test duration: 30 minutes.

## AB\_DO – 8 Digital Outputs to Relay



**Power supply:** Internal bus.  
**Typical consumption:** 0.75 W.  
**Weight:** 530 g.



**AB\_DO M554 x 0 0 0 0 y zz**

**Polarización (Ax):**  
 2: 24 V<sub>DC</sub>  
 3: 48 V<sub>DC</sub>

**Revisión:**  
 (Código de revisión)

**Tropicalizado:**  
 0: Sin tropicalizado  
 2: Tropicalizado AVR80 (por ABchimie)

### Hardware Features

- Outputs: 8.
- Polarization voltage (PV): 24 / 48 VDC.
- Polarization range: From 80% to 120% PV.
- Polarization consumption: 0.4 W/relay.
- Maximum output current: 16 A (relay), 5 A (terminal).
- Output switching capacity (L/R = 20 ms):
  - 125 VDC / 150 mA.
  - 48 VDC / 500 mA.
  - 24 VDC / 2 A.
  - 12 VDC / 5 A.
- Output switching capacity (L/R = 40 ms):
  - 48 VDC / 400 mA.
  - 24 VDC / 1200 mA.
  - 12 VDC / 5 A.
- Isolation: Through 2.5 kV<sub>RMS</sub> (between outputs and between outputs and power supply).
- Field connection:
  - 3 screw-terminals 2.5 mm<sup>2</sup> / 13 AWG (digital outputs and polarization input).

### Functional Features

- Output type: Simple / Double.
- Processing of digital outputs:
  - Pulsing (fixed time).
  - Latching.
- Security mechanism: SBO (Select-Before-Operate) and coil feedback.
- Output actuation timing: 1 – 65,535 ms.

### Environmental Conditions

- Operating temperature range: From -40° to 70° C.
- Humidity limit of 95%.
- Coating: AVR80 coating (for more information, please consult [www.abchimie.com](http://www.abchimie.com)).
- Protection level: IP 20.

## AB\_DO – 8 Digital Outputs to Relay

### Standard Compliance

<b>CE Mark</b>	According to the European Directive of Low Voltage 2006/95/CE and the Electromagnetic Compatibility Directive (EMC) 2004/108/CE.	
<b>EMC</b>	<p>Electrostatic discharge immunity.</p> <p>Radiated, RF, EM field immunity.</p> <p>EM immunity, fast transient burst.</p> <p>EM immunity, surge.</p> <p>EM immunity, RF in common mode.</p> <p>EM immunity, magnetic field.</p> <p>EM emission, radiated emission.</p> <p>EM emission, conducted emission.</p>	<p>EN 61000-4-2, by contact <math>\pm 6</math> kV (Level 3).</p> <p>EN 61000-4-3, between 80 and 2700 MHz (Level 3).</p> <p>EN 61000-4-4, power supply: <math>\pm 2</math> kV, communication: <math>\pm 1</math> kV (Level 3).</p> <p>EN 61000-4-5, power supply: <math>\pm 2</math> kV symmetric and asymmetric (Level 3).</p> <p>EN 61000-4-6 (Level 3).</p> <p>EN 61000-4-8, 30 A/m at 50 Hz (Level 4).</p> <p>EN 55022, from 30 to 1000 MHz (Class A).</p> <p>EN 55022, from 0.15 to 30 MHz (Class A).</p>
<b>Electric Safety</b>	<p>General requirements (IEC 60950-1).</p> <p>Insulation and dielectric rigidity (IEC 60255-5).</p>	<p>Meets all the requirements indicated in the normative.</p> <p>Isolation <math>&gt; 100 \text{ M}\Omega</math>, 2 kVAC.</p>
<b>Environmental</b>	<p>Cold test (UNE-EN 60068-2-1).</p> <p>Dry heat test (IEC 60068-2-2).</p> <p>Bump test (IEC 60068-2-29).</p> <p>(Vertical axis)</p> <p>Random vibration test (UNE-EN 60068-2-64).</p> <p>(3 axes)</p>	<p><math>-40^\circ \text{ C}</math> during 16 h (from cold start).</p> <p><math>+70^\circ \text{ C}</math> during 16 h.</p> <p>Acceleration: <math>250 \text{ m/s}^2</math>.</p> <p>Pulse duration: 6 ms.</p> <p>Number of shocks: 100 shocks/axis/polarity.</p> <p>Range: From 10 Hz to 500 Hz.</p> <p>Test duration: 30 minutes.</p>

## AB\_DIDO – 16 Digital Inputs and 8 Digital Output



AB\_DIDO M572 x x 0 0 0 y zz

**DI Pol (Ax):**

- 2: 12 – 24 V<sub>DC</sub>
- 3: 48 V<sub>DC</sub>
- 4: 125 V<sub>DC</sub>

**DO Pol (Bx):**

- 2: 24 V<sub>DC</sub>
- 3: 48 V<sub>DC</sub>

**Revision:**  
(Revision code)

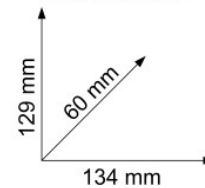
**Coating:**

- 0: Without coating
- 2: AVR80 coating (by ABchimie)

### Hardware Features (Inputs)

- Inputs: 16.
- Maximum number of counter inputs: 16.
- Inputs per common: 4.
- Polarization voltage (PV): 12-24 / 48 / 125 VDC (depending on the ordering options).
- Input current per signal: < 5.5 for the nominal polarization voltage (PV).
- Nominal value at level "1": From 80% to 120% PV.
- Nominal value at level "0": From 0 to 30% PV.
- Polarization range: From 80% to 120% PV.
- Polarization blocks isolation: 2.5 kV<sub>RMS</sub>.

**Power supply:** Internal bus.  
**Typical consumption:** 0.75 W.  
**Weight:** 720 g.



### Hardware Features (Outputs)

- Outputs: 8.
- Polarization voltage (PV): 24/48 VDC.
- Polarization range: From 80% to 120% PV.
- Polarization consumption: 0.4 W/relay.
- Maximum output current: 16 A (relay), 5 A (terminals).
- Output switching capacity L/R = 20 ms: 125 VDC / 150 mA, 48 VDC / 500 mA, 24 VDC / 2 A and 12 VDC / 5 A.
- Output switching capacity L/R = 40 ms: 48 VDC / 400 mA, 24 VDC / 1200 mA and 12 VDC / 5 A.
- Isolation: 2.5 kV<sub>RMS</sub> (between outputs and between outputs and power supply).

### Hardware Features (Generals)

- 5 screw-terminals 2.5 mm<sup>2</sup> / 13 AWG (digital inputs, digital outputs and polarization input).

### Functional Features (Inputs)

- Input type: Simple / Double / Slow counter.
- Processing of digital inputs:
  - Status indication (single and double).
  - Memorized indication.
  - 32-bit pulse counter, 45 Hz (single or double edge).
- Timestamp: 1 ms.
- Filtering time: 0 – 255 ms.
- Settling time: 0 – 25500 ms.
- Change memory: 0 – 2550 ms.
- Anti-chattering window: 0 – 255 s.
- Number of events for chattering: 1 – 255 changes.

## AB\_DIDO – 16 Digital Inputs and 8 Digital Outputs

### Functional Features (Outputs)

- Output type: Simple / Double.
- Processing of digital outputs:
  - Pulsing (fixed time).
  - Latching.
- Safety mechanism: SBO (Select-Before-Operate) and coil feedback.
- Output actuation timing: 1 – 65,535 ms.

### Environmental Conditions

- Operating temperature range: From -40° to 70° C.
- Humidity limit of 95%.
- Coating: AVR80 coating (for more information, please consult [www.abchimie.com](http://www.abchimie.com)).
- Protection level: IP 20.

### Standard Compliance

<b>CE Mark</b>	According to the European Directive of Low Voltage 2006/95/CE and the Electromagnetic Compatibility Directive (EMC) 2004/108/CE.	
<b>EMC</b>	Electrostatic discharge immunity. Radiated, RF, EM field immunity. EM immunity, fast transient burst. EM immunity, surge. EM immunity, RF in common mode. EM immunity, magnetic field. EM emission, radiated emission. EM emission, conducted emission.	EN 61000-4-2, by contact $\pm 6$ kV (Level 3). EN 61000-4-3, between 80 and 2700 MHz (Level 3). EN 61000-4-4, power supply: $\pm 2$ kV, communication: $\pm 1$ kV (Level 3). EN 61000-4-5, power supply: $\pm 2$ kV symmetric and asymmetric (Level 3). EN 61000-4-6 (Level 3). EN 61000-4-8, 30 A/m at 50 Hz (Level 4). EN 55022, from 30 to 1000 MHz (Class A). EN 55022, from 0.15 to 30 MHz (Class A).
<b>Electric Safety</b>	General requirements (IEC 60950-1). Insulation and dielectric rigidity (IEC 60255-5).	Meets all the requirements indicated in the normative. Isolation $>100$ M $\Omega$ , 2 kVAC.
<b>Environmental</b>	Cold test (UNE-EN 60068-2-1). Dry heat test (IEC 60068-2-2). Bump test (IEC 60068-2-29). (Vertical axis)  Random vibration test (UNE-EN 60068-2-64). (3 axes)	-40° C during 16 h (from cold start). +70° C during 16 h. Acceleration: 250 m/s <sup>2</sup> . Pulse duration: 6 ms. Number of shocks: 100 shocks/axis/polarity. Range: From 10 Hz to 500 Hz. Test duration: 30 minutes.

### Authorized Distributor

PT. Tri Mitra Elektrik  
L' Agricola Blok C No. 9  
Gading Serpong Tangerang 15810