



## ON/OFF-GRID TRANSFER CABINET

# PULSE

P500 · P1000 · P2000

0.5 – 2 MW · 400 V AC  
STATIC TRANSFER ≤ 10 MS

≤ 10 ms

TRANSFER TIME  
P2000 ≤ 20 ms

0.5–2 MW

RATED POWER  
Three frames

400 V AC

MICROGRID BUS  
3W + N + PE · 50 / 60 Hz

6 ports

SWITCHED  
+ manual bypass

IP55

OUTDOOR  
IP21 indoor

### WHY THE LOAD STAYS ON

### FIVE DESIGN DECISIONS

01

#### Half a cycle

Static switching moves the bus in ≤ 10 ms, half a 50 Hz cycle. Critical loads ride through.

02

#### Acts before the outage

Watches voltage, frequency and harmonics, and starts the transfer as the grid degrades.

03

#### One cabinet, MW scale

Up to 2 MW through a single cabinet. No stack of transfer panels to coordinate.

04

#### Grid, genset, sun, storage

Two sources ahead of the switch, load, battery and PV behind it, metered port by port.

05

#### Bypass for service

A manual bypass feeds the load straight from the grid while the cabinet is isolated.



SWITCHING  
600 kW STS modules



STS MODULE · CE LVD  
EN 62310



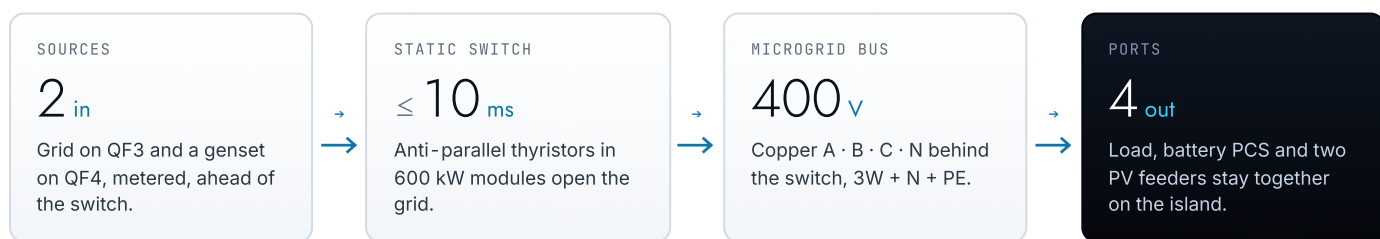
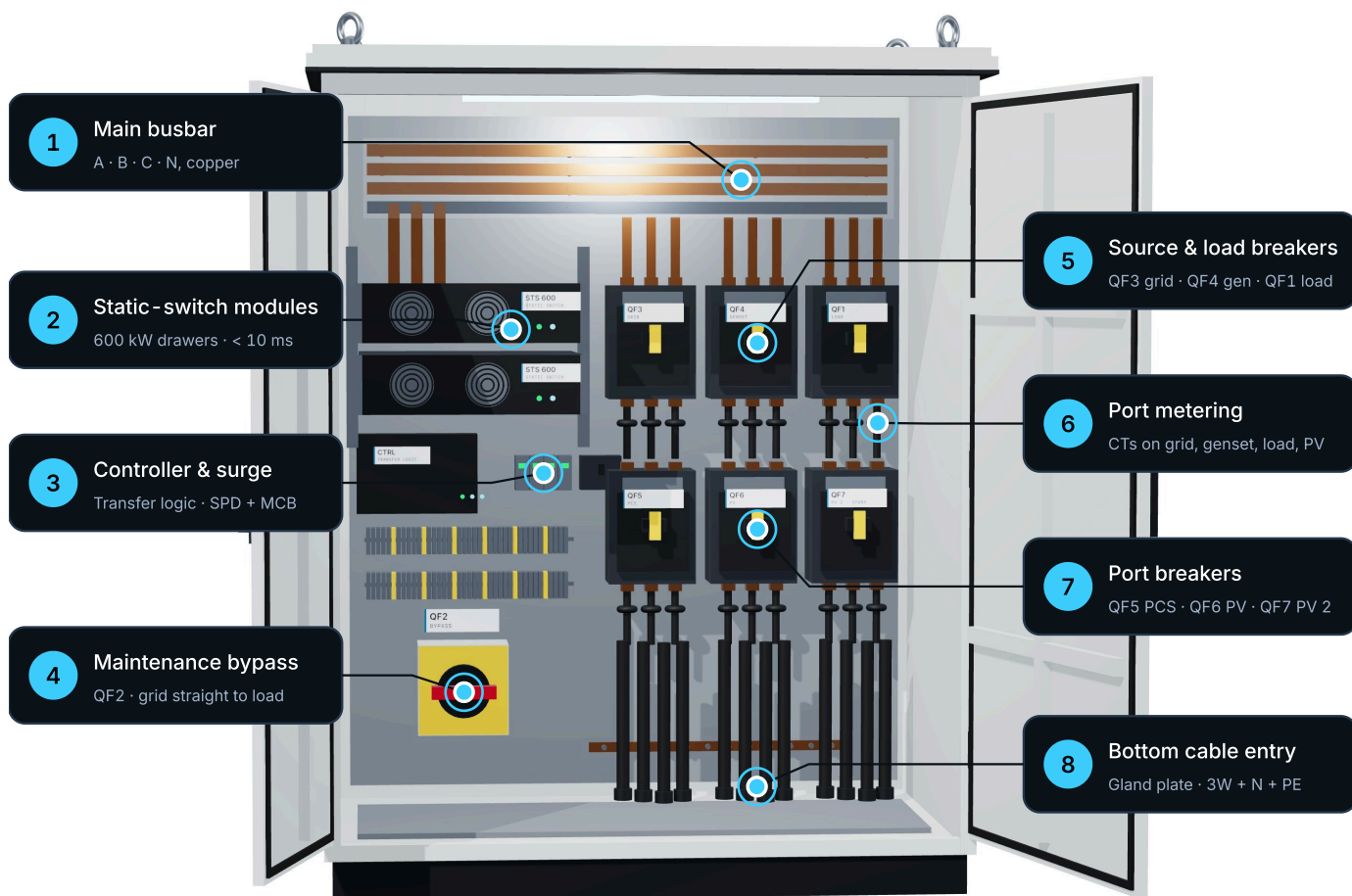
CONTROL  
Solaris™ EMS

02 · ANATOMY

Every source,  
one switch.

02

One cabinet carries the static switch, a breaker for every port, the metering and the surge protection. Front access; cables enter from below.



| FOOTPRINT                | HEIGHT          | WEIGHT               | PROTECTION            | AMBIENT               |
|--------------------------|-----------------|----------------------|-----------------------|-----------------------|
| <b>1 600 × 1 000</b>     | <b>2 100 mm</b> | <b>≈ 650 kg</b>      | <b>IP55</b>           | <b>−35 ... +50 °C</b> |
| mm, P500 · P1000 outdoor | all frames      | P500 · P1000 outdoor | outdoor · IP21 indoor | derating above 45 °C  |

Render shows the P1000 outdoor cabinet with both doors open. Internal arrangement is typical; the project drawings fix the final layout.

## 03 · SPECIFICATION

## PULSE · three frames

03

Typical configuration. Final values are fixed in the project technical agreement.

 $\leq 10$  ms

TRANSFER · P500 · P1000

500—2 000 kW

RATED · 110 % MAX

400 V

3W + N + PE · 50/60 HZ

IP55 / IP21

OUTDOOR / INDOOR

MODEL P500 P1000 P2000

## 01 POWER

|                        |            |          |          |
|------------------------|------------|----------|----------|
| Rated power            | 500 kW     | 1 000 kW | 2 000 kW |
| Maximum power          | 550 kW     | 1 100 kW | 2 200 kW |
| Rated current          | 722 A      | 1 443 A  | 2 887 A  |
| Maximum current        | 792 A      | 1 584 A  | 3 175 A  |
| PCS port, rated        | 500 kW     | 1 000 kW | 2 000 kW |
| Load port, rated       | 500 kW     | 1 000 kW | 2 000 kW |
| PV, single / dual port | 0.5 / 1 MW | 1 / 2 MW | 2 / 4 MW |

## 02 TRANSFER

|                  |                                        |              |
|------------------|----------------------------------------|--------------|
| Switching device | Thyristor static switch                | Breaker      |
| Transfer time    | $\leq 10$ ms                           | $\leq 20$ ms |
| Sensing          | V, f, phase angle · grid, genset, load |              |
| Early trigger    | Grid V, f and harmonics                |              |
| Operating modes  | On-grid · island · genset · bypass     |              |
| Mains ↔ genset   | Automatic change-over                  |              |
| STS module       | 600 kW · up to 99 %                    | —            |

MODEL P500 P1000 P2000

## 03 ELECTRICAL

|                  |                                       |
|------------------|---------------------------------------|
| Voltage          | 400 V AC · 3W + N + PE                |
| Frequency        | 50 / 60 Hz                            |
| Protection class | I (earthed)                           |
| Surge protection | SPD on the load bus, with MCB         |
| Metering         | CTs on grid, genset, load, PV 1, PV 2 |

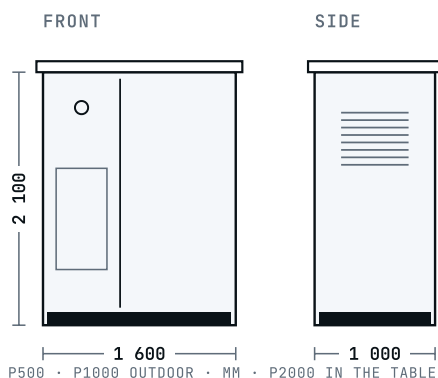
## 04 ENCLOSURE &amp; ENVIRONMENT

|                    |                                       |               |
|--------------------|---------------------------------------|---------------|
| Ingress protection | IP21 indoor · IP55 outdoor            |               |
| W × D, indoor      | 1 500 × 900 mm                        | 1 600 × 900   |
| W × D, outdoor     | 1 600 × 1 000 mm                      | 1 800 × 1 000 |
| Height             | 2 100 mm                              |               |
| Weight, in / out   | ≈ 600 / 650 kg                        | ≈ 700 / 750   |
| Ambient            | −35 ... +50 °C · derating above 45 °C |               |
| Relative humidity  | 0 – 95 %, non-condensing              |               |
| Altitude           | 3 000 m · derating above              |               |

## 05 CONTROL

|                |                                  |
|----------------|----------------------------------|
| Interfaces     | RS-485 · CAN · Ethernet          |
| Master control | Integrated · PV, storage, genset |

## GENERAL ARRANGEMENT



## MODEL CODE

P 1000 - 0

P PULSE · P2000 on frame breakers  
1000 rated power, kW  
0 outdoor · I indoor**Scope:** cabinet, transfer devices, QF1–QF7,  
CTs, SPD and controller, factory-integrated  
and tested before dispatch. Cabling, plinth and  
upstream protection per project.

## Size your transfer.

Send the single-line, the critical  
load and the genset you have. We  
return the frame, the port plan and  
the switching study.[info@amproteq.energy](mailto:info@amproteq.energy)  
+27 82 552 6696

04 · SINGLE-LINE

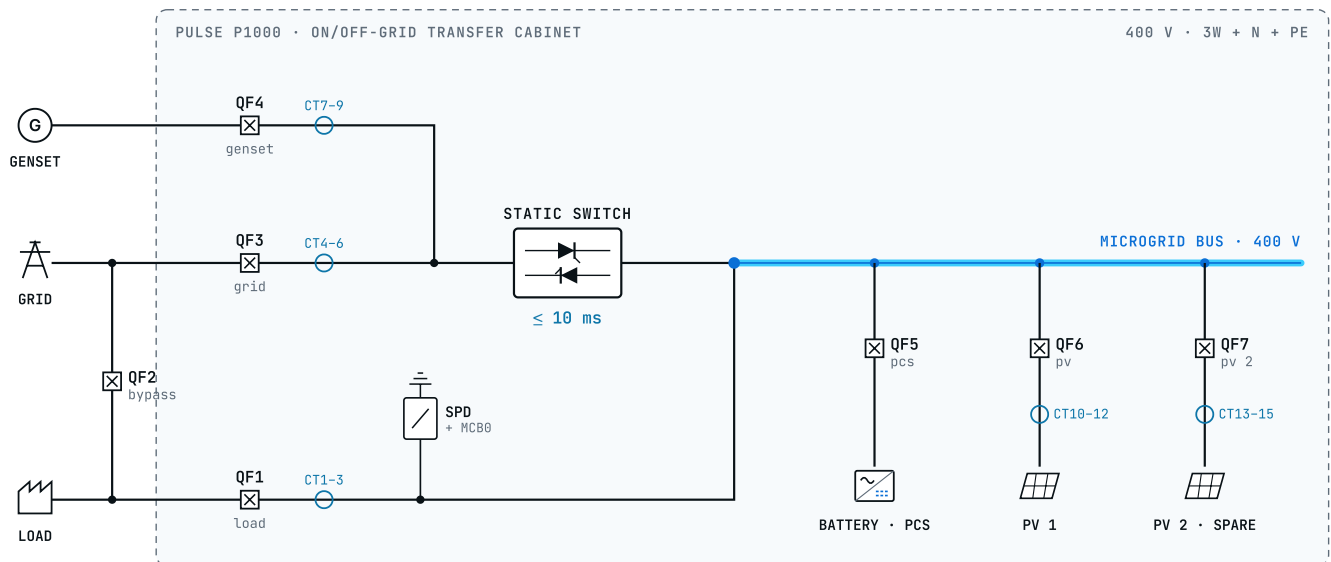
# One bus, six ports.

04

Grid and genset meet ahead of the static switch. Load, battery and PV share the bus behind it, so the island keeps every port. QF2 bypasses the cabinet for service.

FIG 04-1 · SYSTEM SINGLE-LINE

P500 · P1000 · SIMPLIFIED



## P2000

≤ 20 ms

The 2 MW frame switches with breakers. Same ports and the same single-line, without the thyristor block: frame breakers on the source side open the grid, and the transfer completes within one 50 Hz cycle.

**On a grid fault** the controller sees the sag, opens the switch and hands the bus to the battery PCS, which forms the voltage. PV keeps following it.

**On return** it matches voltage, frequency and phase angle across the switch before closing back, so the load is not hit twice.

### PER PORT · P1000

AT 400 V

|                     |                    |
|---------------------|--------------------|
| Grid · QF3          | 1 000 kW · 1 443 A |
| Genset · QF4        | per project        |
| Load · QF1          | 1 000 kW           |
| PCS · QF5           | 1 000 kW           |
| PV 1 · QF6          | 1 000 kW           |
| PV 2 · QF7          | 1 000 kW → 2 MW    |
| Bypass · QF2        | sized to the load  |
| Peak, 10 % headroom | 1 100 kW · 1 584 A |

### SIGNALS IN DRY CONTACTS

|                              |                       |
|------------------------------|-----------------------|
| Switch positions             | grid · genset · load  |
| Switch positions             | PV · battery · bypass |
| External EPO                 | N/O                   |
| EMS fault                    | N/C, opens            |
| Transformer over-temperature | N/C                   |
| Battery fault                | N/C                   |

### SIGNALS OUT · COMMS CONTROLLER

|                        |                |
|------------------------|----------------|
| PCS AC / DC trip       | D0 · 230 V 1 A |
| Transformer pre-charge | D0             |
| EMS link               | RS-485 · CAN   |
| Plant network          | Ethernet       |
| Module paralleling     | CAN bus        |
| Current sensing        | CT per phase   |

### CERTIFICATES

### SWITCH MODULE

|                       |          |      |
|-----------------------|----------|------|
| EN 62310 · STS module | CE · LVD | RoHS |
| REACH                 |          |      |

EN 62310 and CE LVD cover the static-switch module. Grid-code approvals such as NRS 097-2-1 sit with the converter PULSE pairs with, not with the cabinet.

05 · HOW IT SWITCHES

# Four modes. The load rides through.

05

PULSE reads the grid, the genset and the load side at once: voltage, frequency, phase angle and harmonics. It moves the bus between sources and closes back in phase.

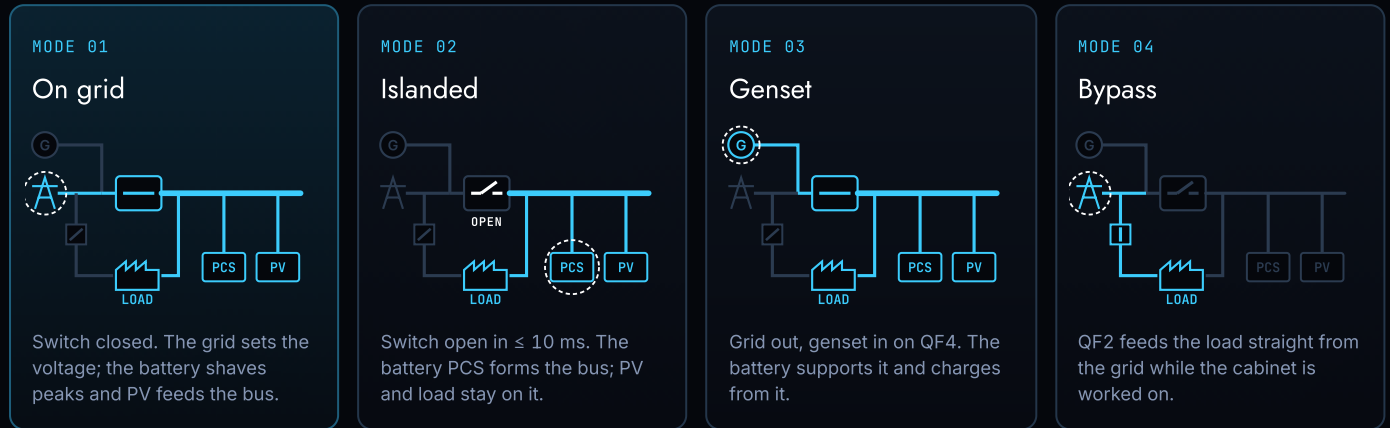


FIG 05-2 · A GRID FAULT, MILLISECOND BY MILLISECOND

ILLUSTRATIVE · 50 HZ

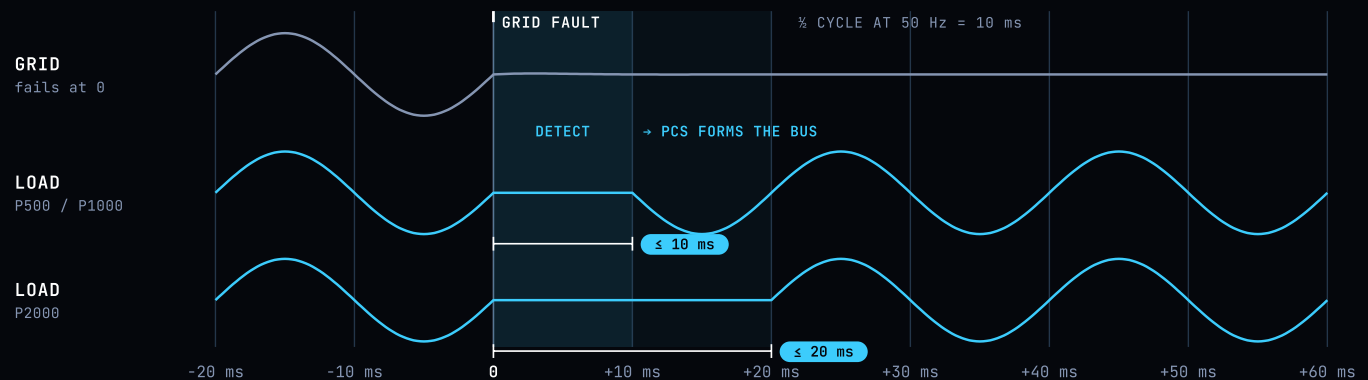
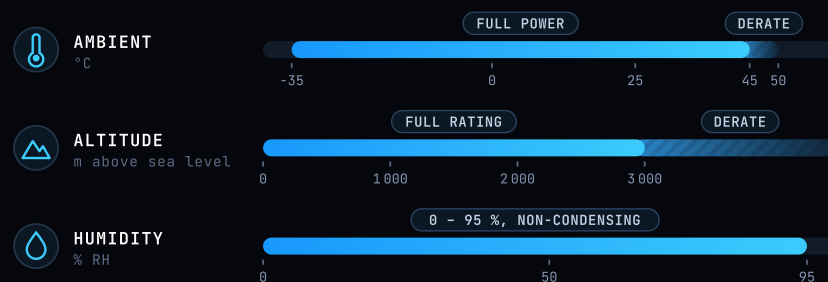


FIG 05-3 · OPERATING ENVELOPE

FULL · DERATED



BACK ON GRID

FOUR STEPS

- 01 **Grid returns** and holds inside limits.
- 02 **Synchronise:** the PCS steers the island to the grid's voltage, frequency and phase.
- 03 **Close** the switch with the two sides matched.
- 04 **Hand back:** the grid sets the voltage again; the battery returns to dispatch.

01

## Backup for a grid-tied battery

Add one PULSE ahead of an APEX A2000 and a grid-following site gains islanded operation.

02

## One cabinet, not a stack

A single cabinet carries MW-scale switching, so there is one controller and one interlock chain.

03

## Under one controller

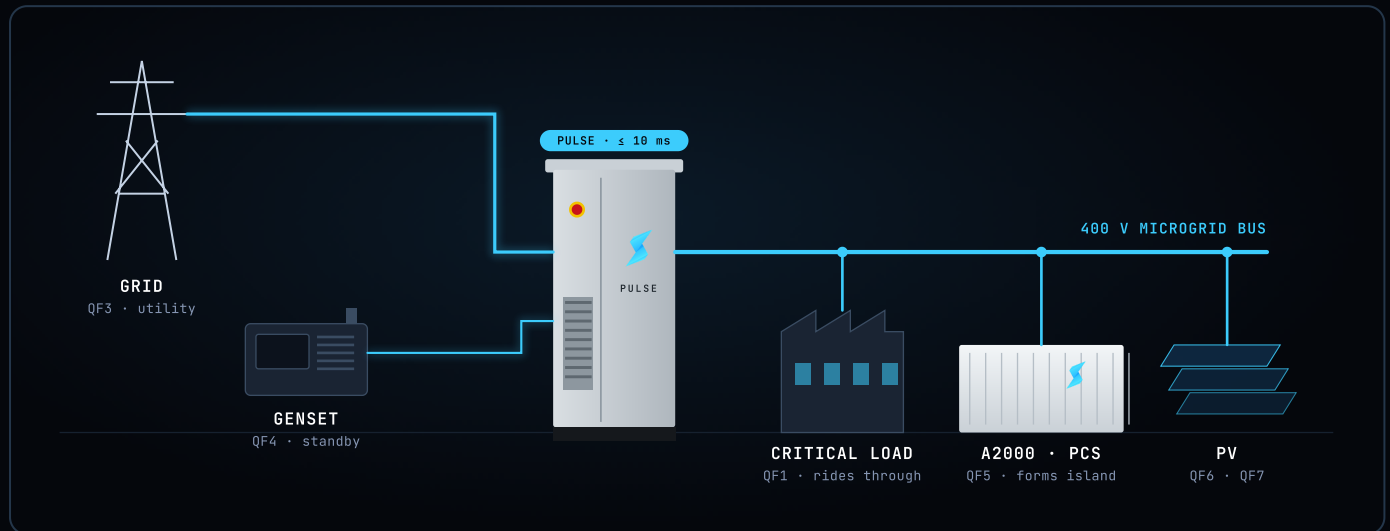
Solaris™ EMS reads the switch over RS-485, CAN or Ethernet and plans around outages.

## 06 • IN THE PLANT

# A grid-tied battery in, backup power out.

06

Put one PULSE between the supply and an APEX A2000, and the site keeps running through an outage: battery and sun first, the genset when it is needed.



## PICK A FRAME

## BY BATTERY POWER

| BATTERY AT THE BUS | PULSE | PV MAX |
|--------------------|-------|--------|
| A2000 • 500 kW     | P500  | 1 MW   |
| A2000 • 1 MW       | P1000 | 2 MW   |
| 2 × A2000 • 1 MW   | P2000 | 4 MW   |

PV max uses both PV ports. Frame rating covers PCS and load at the bus.

## WHAT TO SEND

01

- ✓ Site single-line and point of supply
- ✓ Critical loads and their ride-through need
- ✓ Genset size, if there is one
- ✓ PV on site, kW
- ✓ 12 months of interval data

## THE RANGE

## ONE FAMILY

**APEX A1000 – A6250**  
Containerised battery storage

**NEXUS N2500**  
2.5 MW medium-voltage skid

**PULSE**  
0.5–2 MW on/off-grid transfer

**Solaris™ EMS**  
Plant controller and dispatch

## TALK TO US

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AMP-DS-PULSE • REV 1.0 • 10/2026 • SUBJECT TO CHANGE

