

V-PLC9000 Product Series

Veesta Universal PLC & Teleprotection

(Version 1.0)

V-PLC9000 Product Series ⁽¹⁾

V-PLC9000 Product Series is family of devices:

- Universal PLC terminal **VP-9UPT**
- Analogue channel terminal **VP-9ACT**
- Teleprotection signalling terminal **VP-9PST**
- Coupling devices **VP-9COD**

- **Excellent base for future development activities**

V-PLC9000 Product Series ⁽²⁾

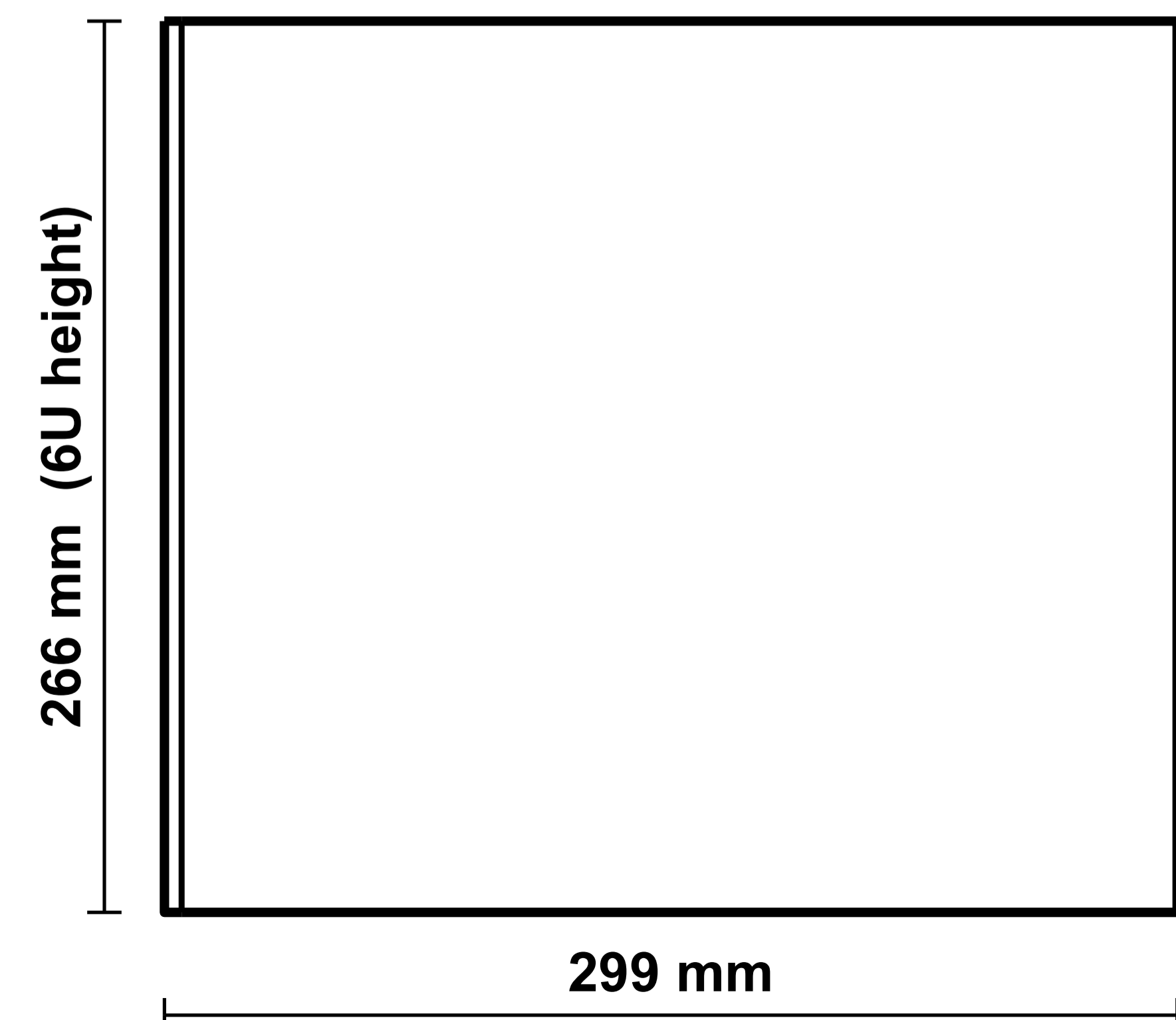
The platform, representing the base for design of various devices with different functionality

- **unified mechanical design**
- **unified power supply system**
- **unified system of internal communications**
- **unified parameterising & diagnostic system**
- **unified technology (VP-9DSP, VP-9CPLD)**
- **unified HW (VP-9DSP platform & VP-9PXYZ module)**

V-PLC9000 Product Series ⁽³⁾

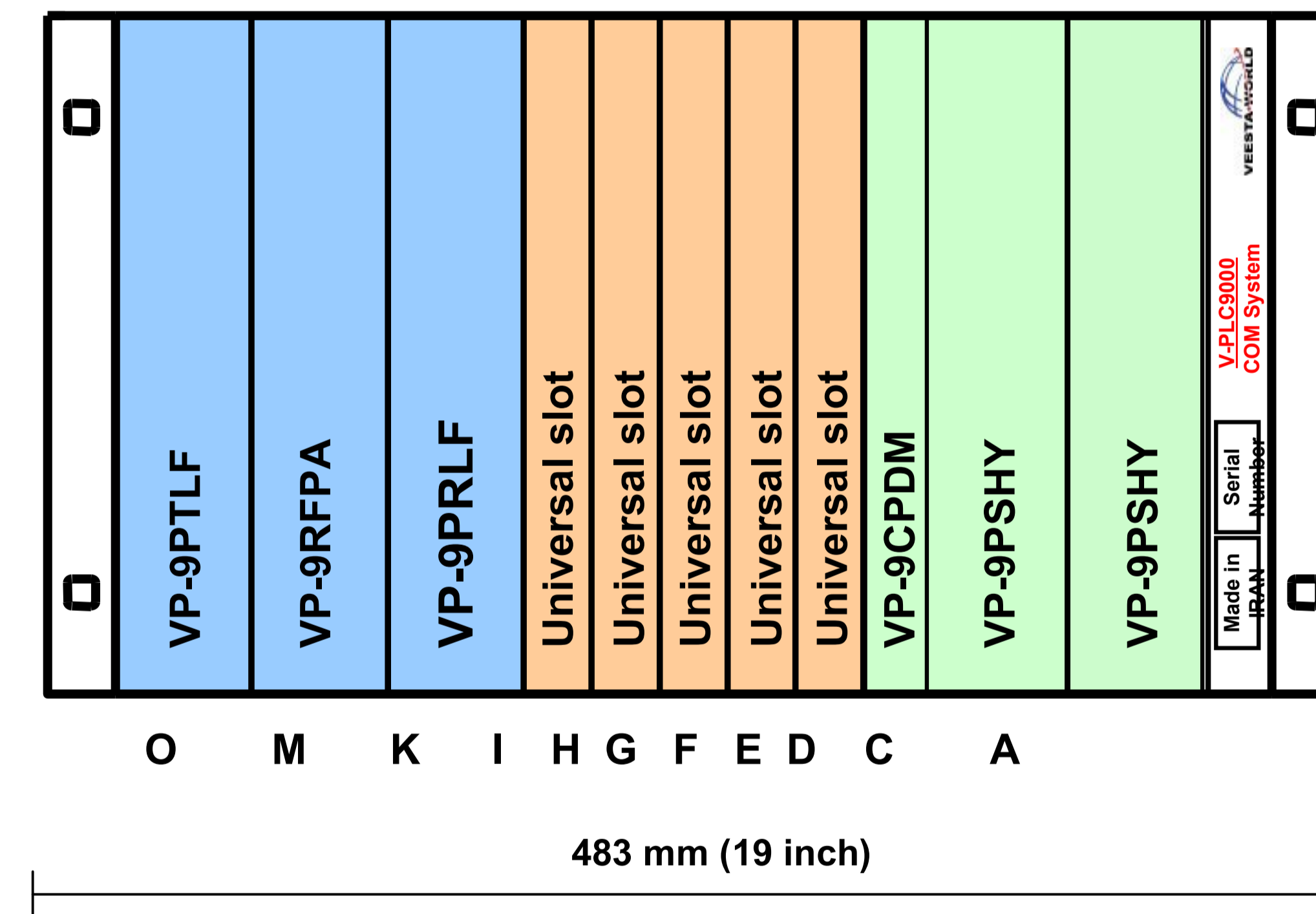
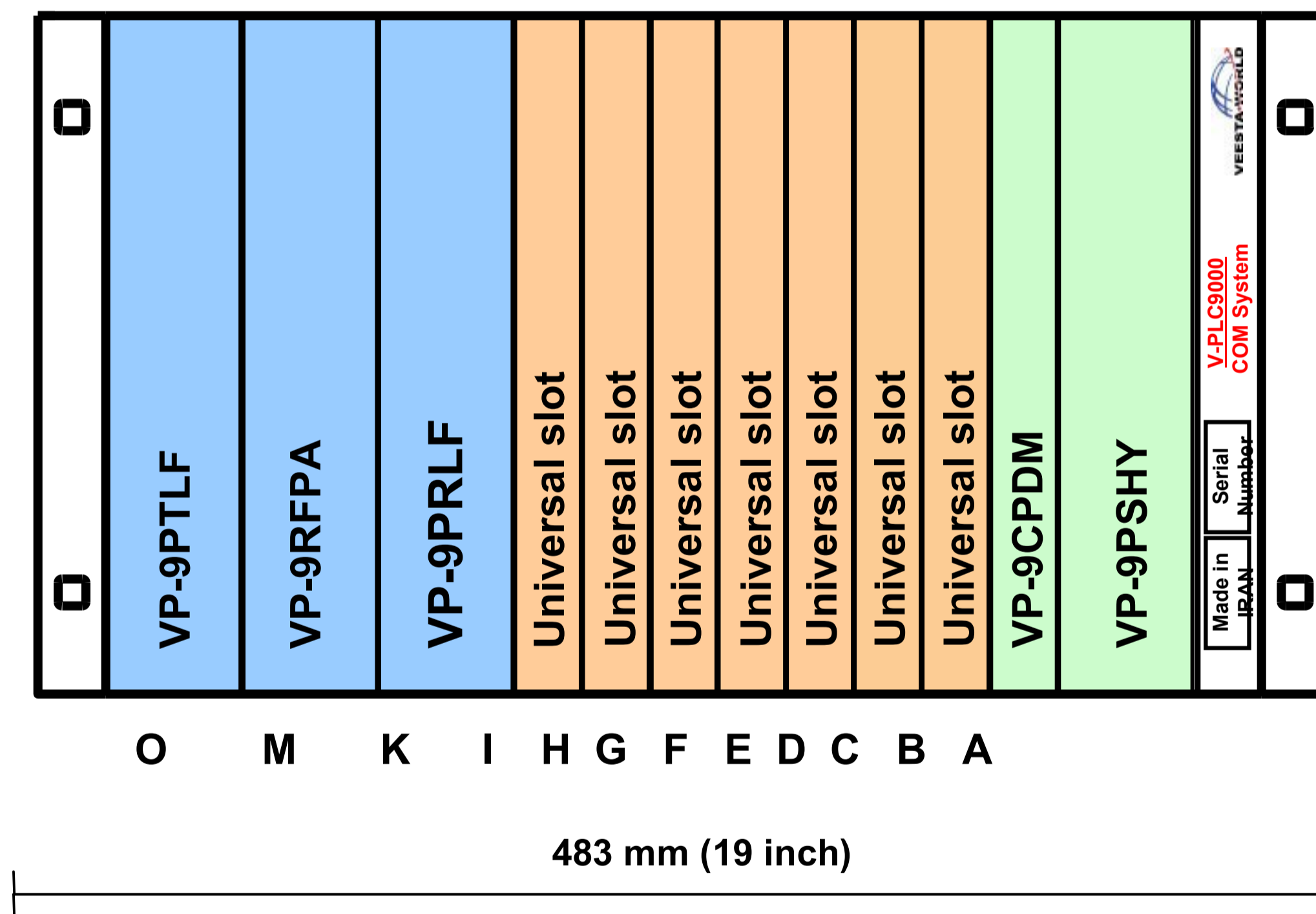
Mechanical Design

- Standard 19" housing
- EMC design of housing
- Dimension of modules: 6U x 5(10)HE x 220 mm
- Installation on the floor-mounted 19" rack or into the cabinet with 19" swing rack
- All connections from the front side



V-PLC9000 Product Series (4)

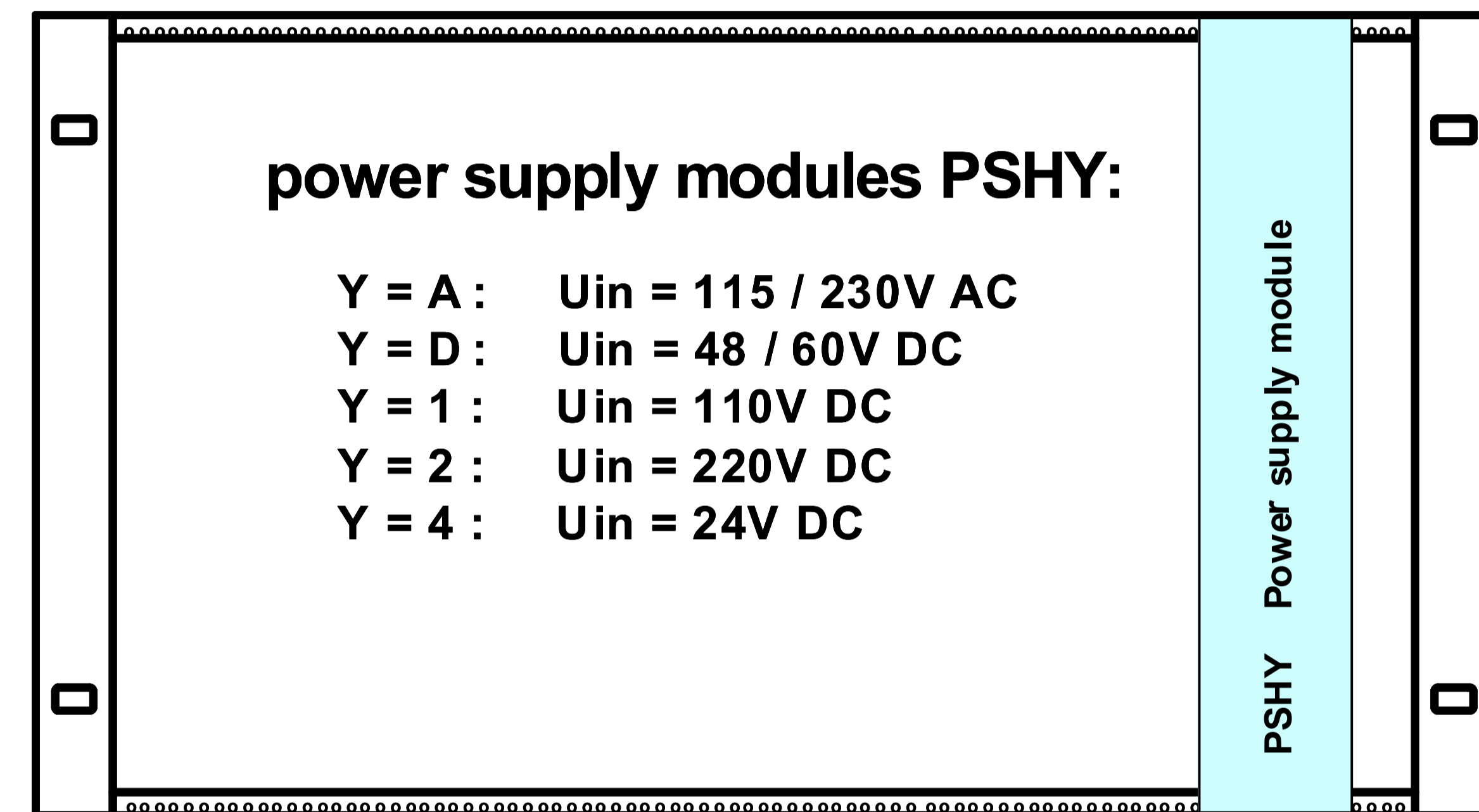
Mechanical Design



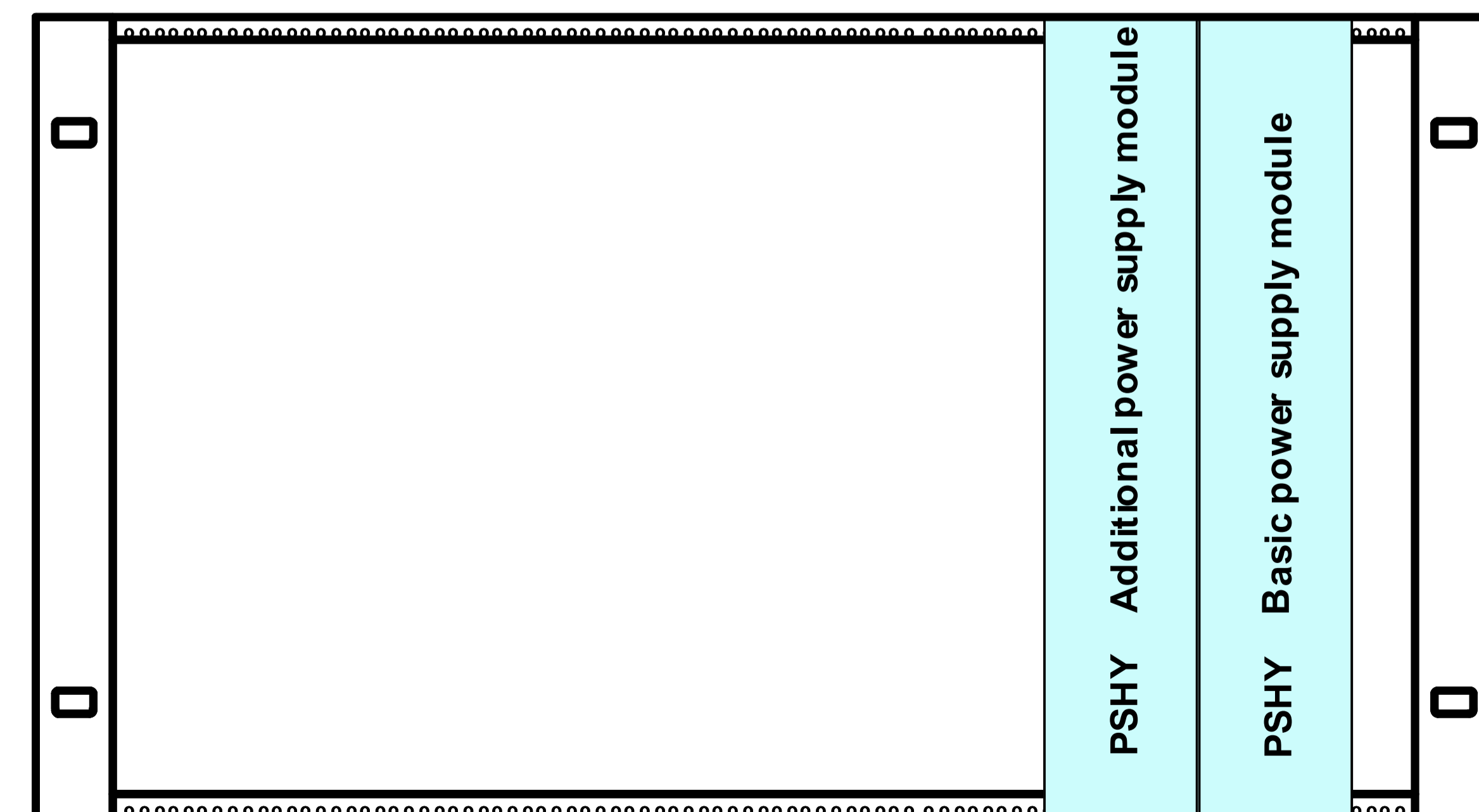
V-PLC9000 Product Series (5)

Power Supply System

- All power supply sources supported
- Redundant scheme of power supply supported
- Distributed internal power supply system
- Excellent design of power supply modules



single power supply



doubled (redundant) power supply

V-PLC9000 Product Series ⁽⁵⁾

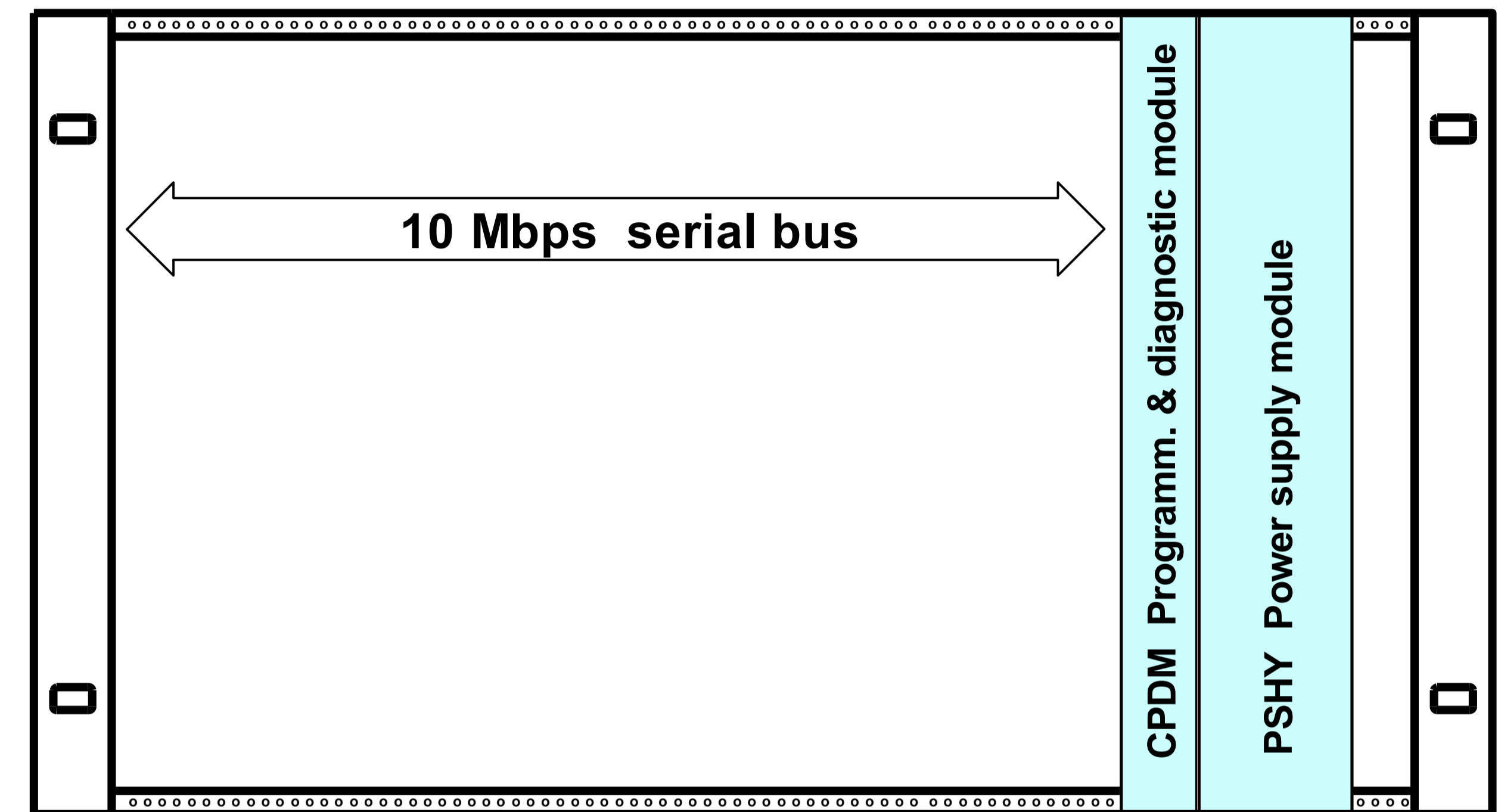
Parameterizing & Diagnostic System

- PC based parameterising & diagnostics system
- User friendly Graphic User Interface (GUI)
- Central parameterising & diagnostics module: CPDM module
- Local or remote access to the equipment

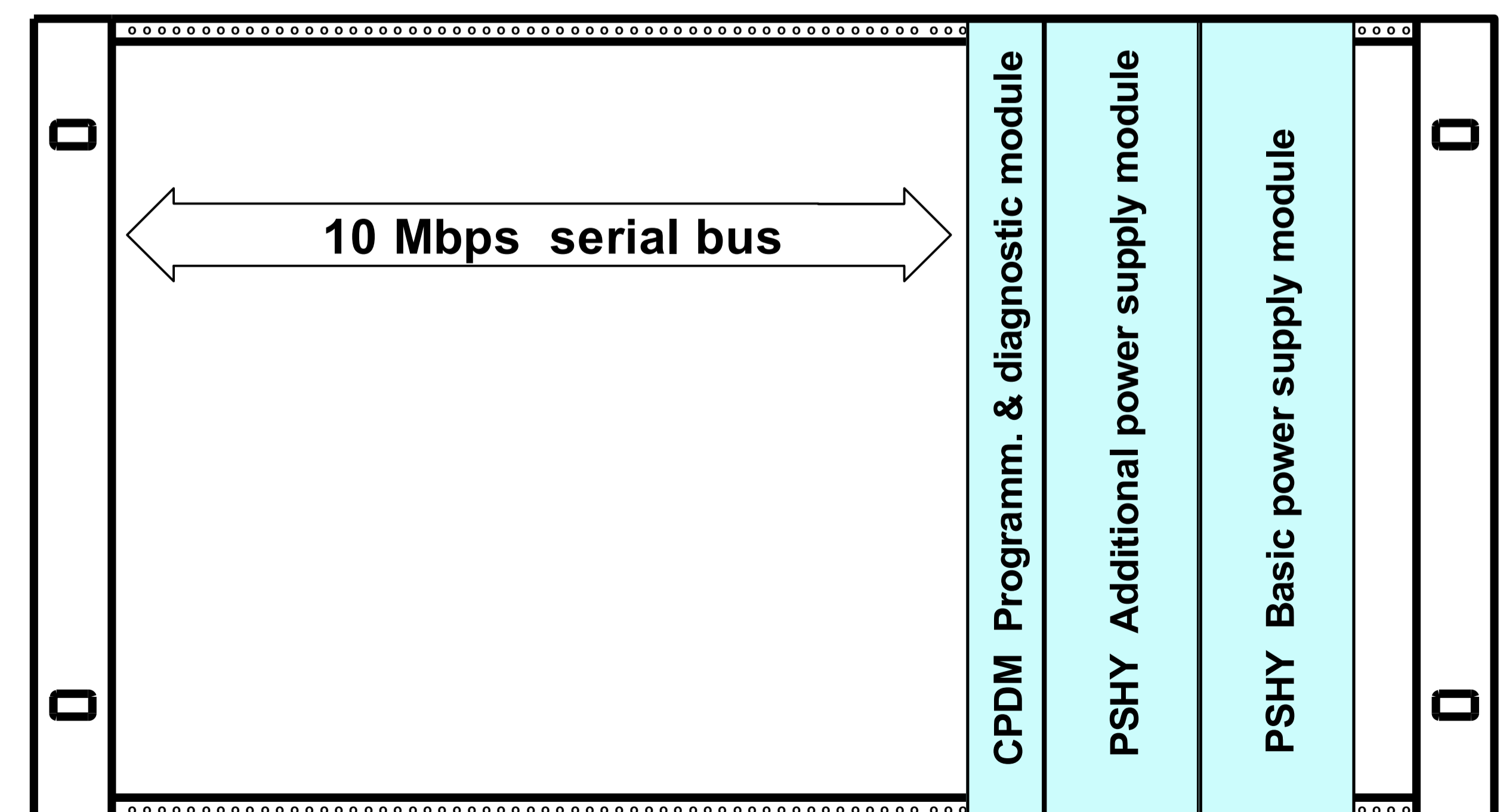
V-PLC9000 Product Series ⁽⁵⁾

Parameterizing & Diagnostic System

- Central parameterising and diagnostics module VP-9CPDM, providing local and remote PC access
- 10 Mbps serial bus providing internal communications



single power supply

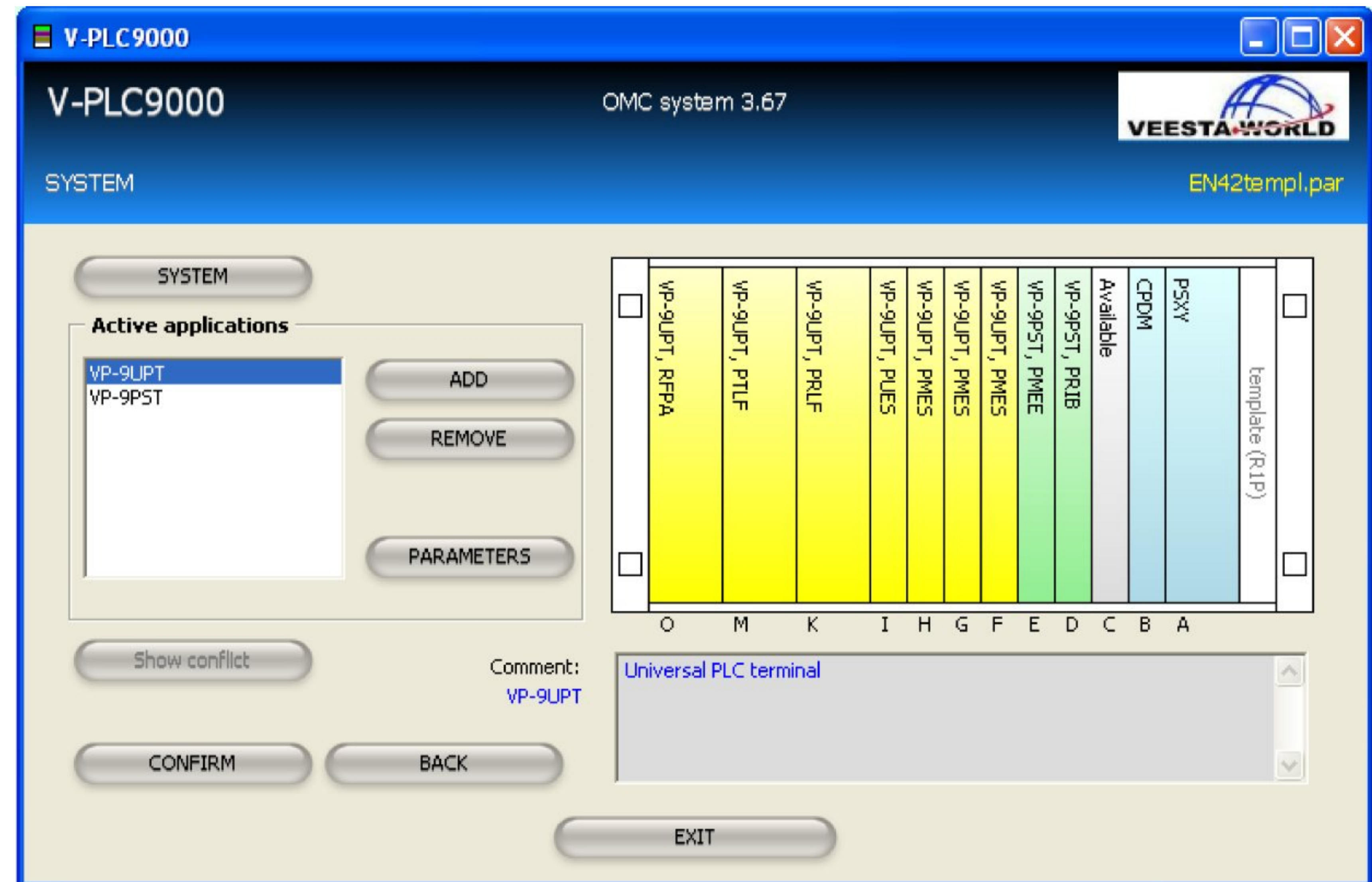


doubled (redundant) power supply

V-PLC9000 Product Series (5)

Parameterizing & Diagnostic System Software

- Multi-language support
- User friendly



V-PLC9000 Product Series ⁽⁵⁾

Technology

- Extensive implementation of Digital Signal Processing (DSP) and Complex Programmable Logic Devices (CPLD)
- Excellent repeatability of DSP based characteristics in serial production
- Excellent temperature and time stability of DSP based characteristics
- Easy programmability
- Compact design
- EMC compatibility and safety

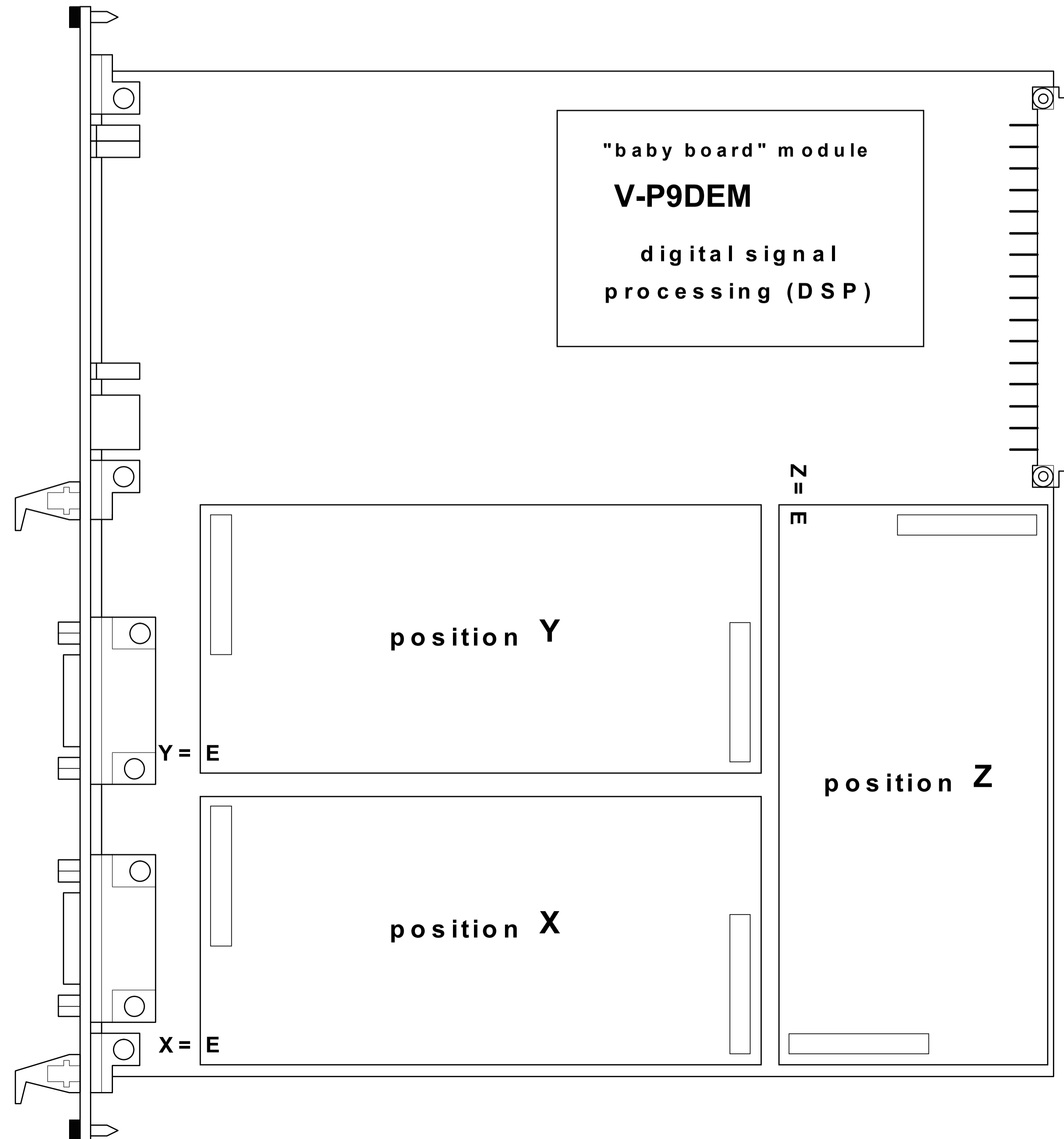
V-PLC9000 Product Series ⁽⁵⁾

Hardware – DSP Platform

- DSP platform based on **C6** family of DSPs from Texas Instruments (TMS320C6203)
- Processing power of 2.4 BIPS
- **VP-9DEM** DSP baby board

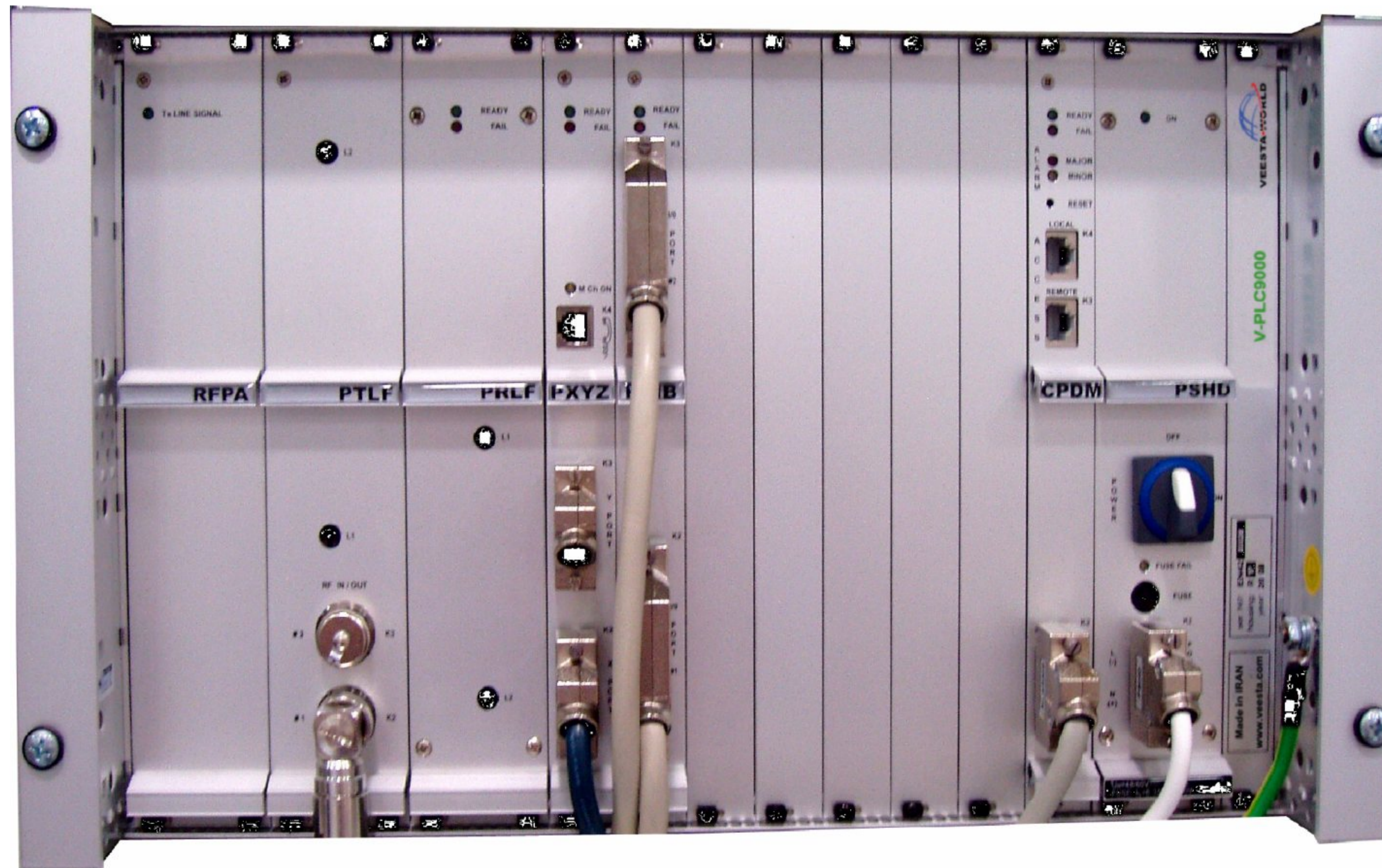
V-PLC9000 Product Series (5)

Hardware – VP-9PXYZ Module



V-PLC9000 Product Series (5)

Hardware – VP-9PXYZ Module

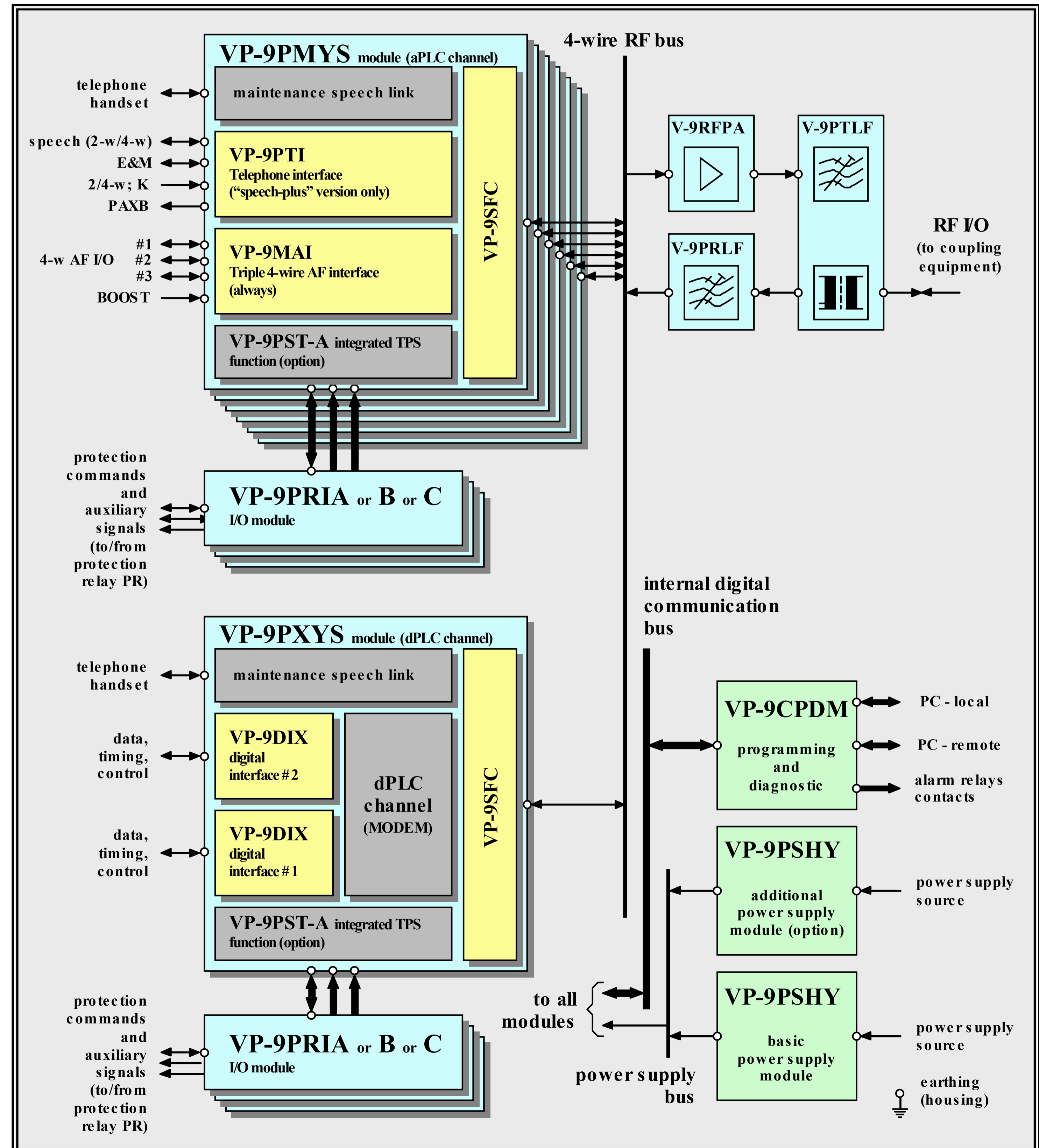


V-PLC 9000

Veesta-PLC9000
Universal PLC & Teleprotection

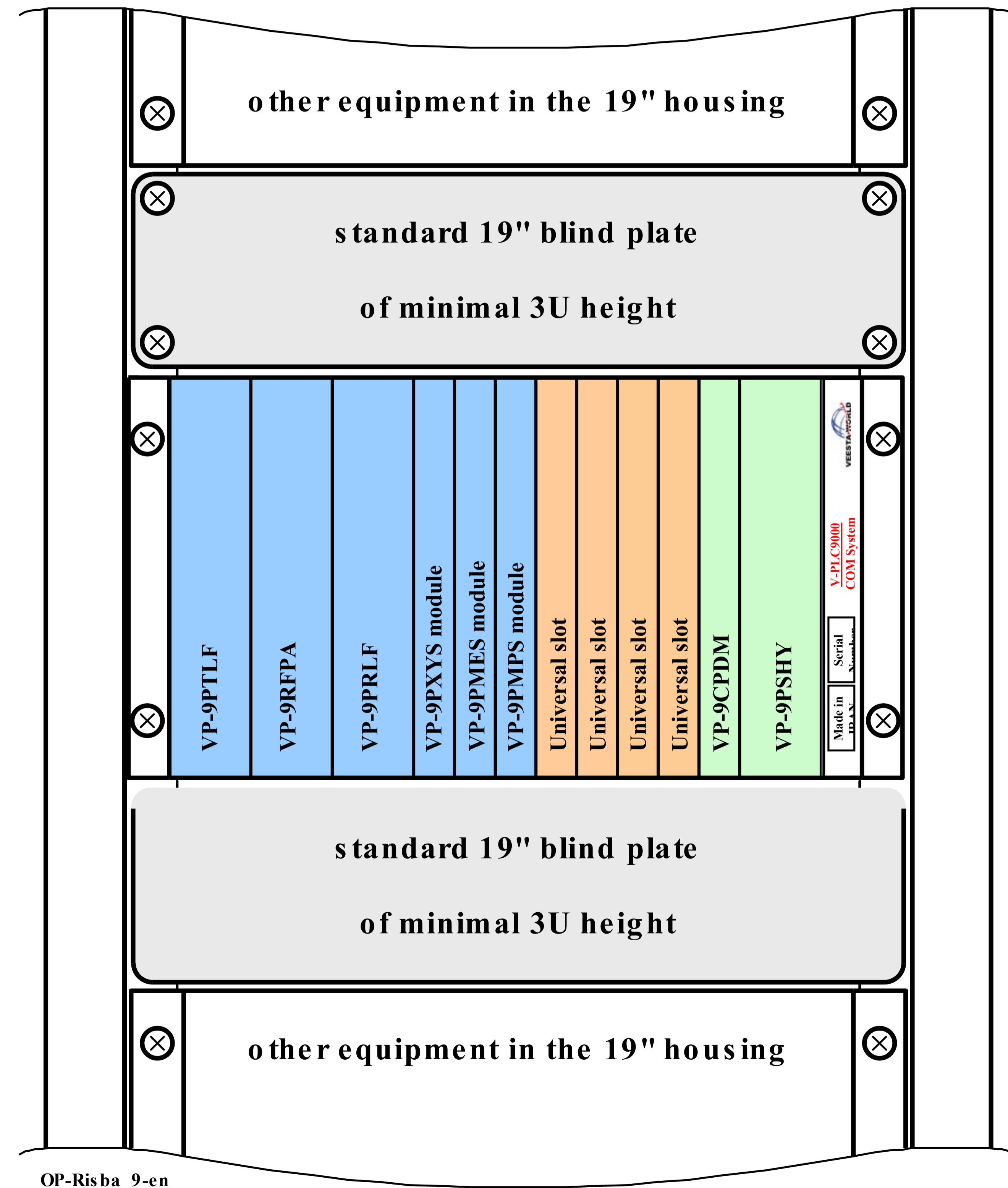
V-PLC9000 Product Series (5)

- Up to 6 analogue (aPLC) channel. and/or 1 digital (dPLC) channel
- Single-step modulation
- Peak Envelope Power (PEP) of 10 W, 20 W, 40 W or 80 W
- Extended RF range: from 20 kHz to 1.000 kHz
- Full programmability without any change of hardware
- IEC 60495 (1993-09) compliant
- Easy integration of teleprotection signalling function (PSE 7)



V-PLC9000 Product Series (5)

- Modular design
- Extremely compact design



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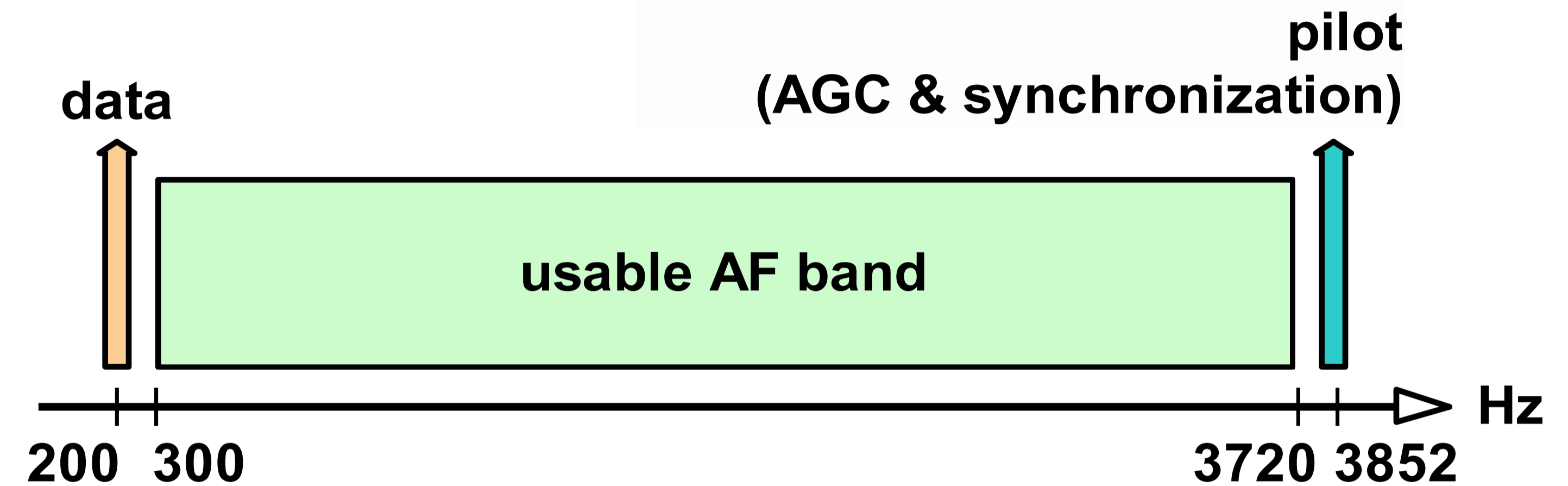
V-PLC 9000

Veesta-PLC9000
Universal PLC & Teleprotection

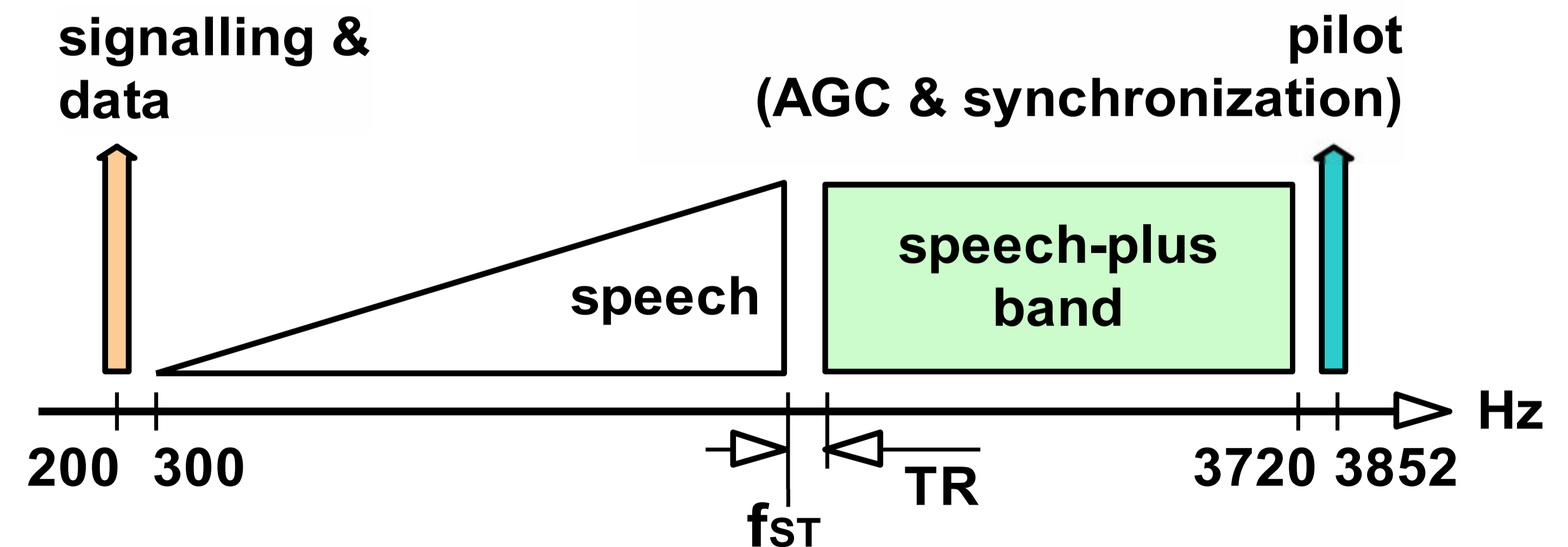
V-PLC9000 Product Series ⁽⁵⁾

aPLC Channel

- “standard” or “speech-plus” version
- Triple AF 4-w interface
- Full programmable universal telephone interface (“speech-plus” version only)



STANDARD aPLC channel

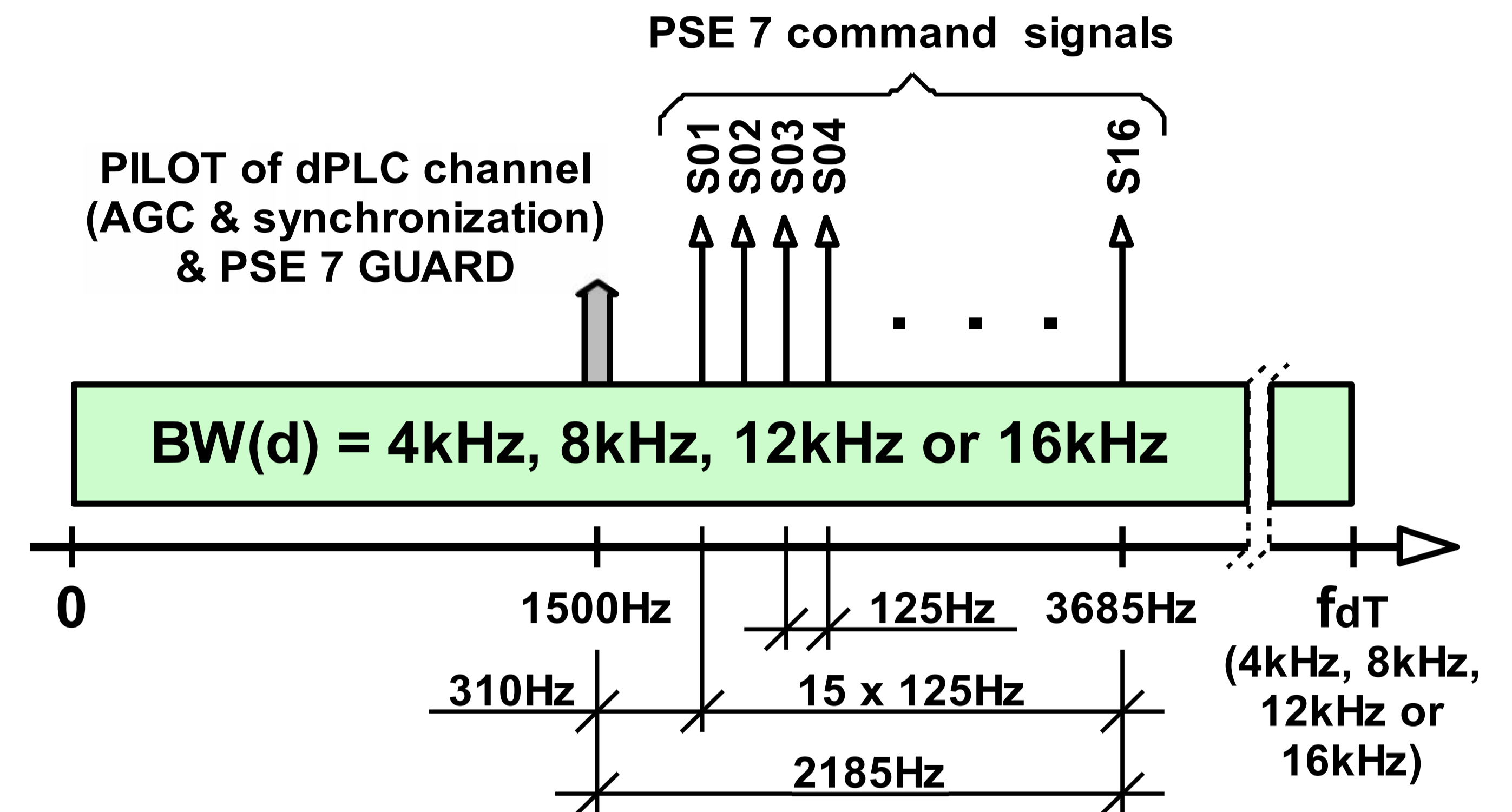


SPEECH-PLUS aPLC channel

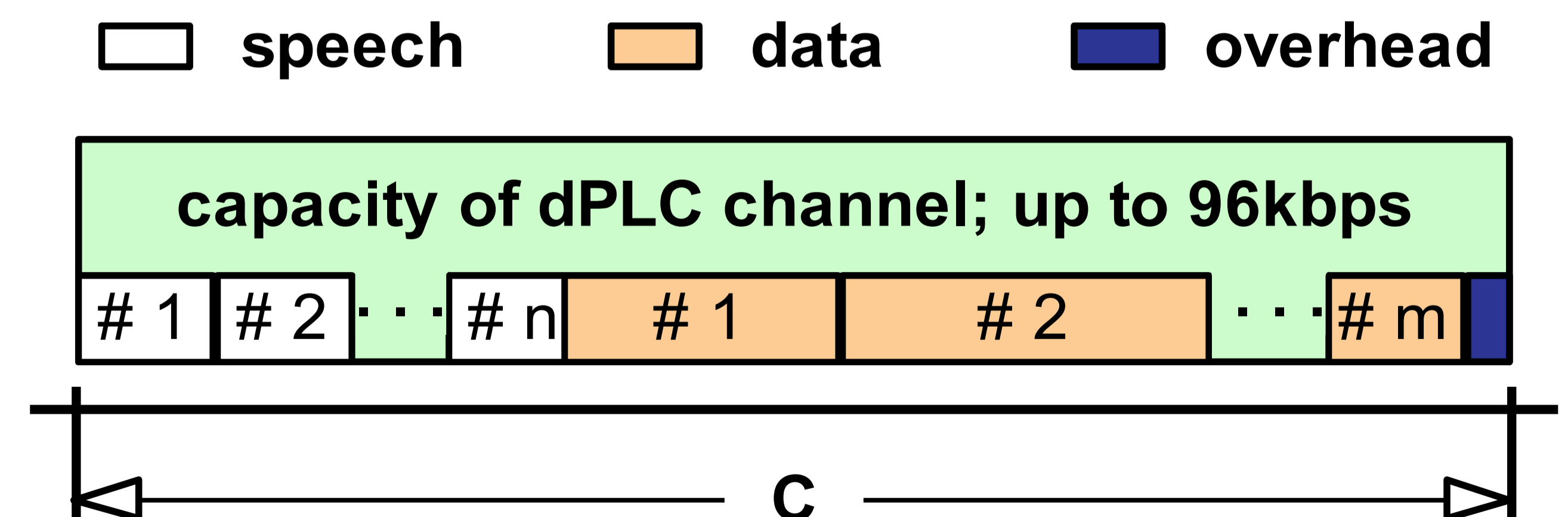
V-PLC9000 Product Series (5)

dPLC Channel

- Programmable frequency bandwidth **BW(d)** and transmission capacity **C(d)**
- Wide range of digital interfaces
- Multi-purpose use provided by external access multiplexer (AMUX)



frequency plan of dPLC channel



multi-purpose use of dPLC channel (AMUX)

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dPLC Channel

- Bandwidth **BW(d)** in kHz: 4, 8, 12 or 16
- Transmission capacity **C(d)** in kbps: 9.6, 14.4, 19.2, 24, 28.8, 32, 48, 56, 64, 72 or 96
- Maximal C(d) regarding to the BW(d):

BW(d) = 4 kHz: C(d)max = 24 kbps

BW(d) = 8 kHz: C(d)max = 48 kbps

BW(d) = 12 kHz: C(d)max = 72 kbps

BW(d) = 16 kHz: C(d)max = 96 kbps

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dPLC Channel

- dPLC channel efficiency **Eff** in bits / second / Hz:

$$\text{Eff (bps/Hz)} = C(d) \text{ (bps)} / \text{BW}(d) \text{ (Hz)}$$

- Higher the Eff, higher the sensitivity to noise !
- Basic rule for dPLC link planning:

Minimize Eff !

(Maximize BW(d) and minimize C(d))

V-PLC9000 Product Series ⁽⁵⁾

dPLC Channel

- Digital interfaces: “baby boards” DIU, DIO and DIA

DIU: RS 232, V.35 and X.21

DIO: G.703; co-directional

DIA: G.703; contra-directional

V-PLC9000, PLC Type Test ⁽⁵⁾



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Potrdilo o preskusu / Certificate of Test

Št. / No.
P223-0002/12

Podatki o izdelku / Identification of product

Communication system and universal PLC Terminal
Model: VEESTA: V-PLC9000 / VP-9UPT

Leto izdelave / Year of manufacture
2011

Proizvajalec / Manufacturer
VEESTA World Company
No. 21, Parastoo Alley, Arasbaran Street, 15416-49911 Tehran, IRAN

Naročnik preskusa / Test ordered by
VEESTA World Company
No. 21, Parastoo Alley, Arasbaran Street, 15416-49911 Tehran, IRAN

Vrsta preskusa in upoštevani standardi/predpisi / Purpose of test and related standard/specifications
See Annex 1 to the Certificate

Poročilo o preskusu - št. in datum izdaje / Test report - No. and date of issue
See Annex 1 to the Certificate

Preskušeni izdelek ustreza navedenim standardom/predpisom in tehničnim podatkom. Potrdilo velja za vse izdelke, ki so identični deponiranemu vzorcu oziroma so izdelani po tehnični dokumentaciji, katere kopija je deponirana v preskuševališču.
The tested product complies with cited standards/regulations and technical specifications. This certificate is valid for the products identical to the tested sample and manufactured according to the technical documentation, the copy of which is held in the testing laboratory.

Opomba / Remark
Mapa predmeta št. / Subject file No.
C20040224, C20060558, C20051303, C20091623, C20101485

Ljubljana, 2012-01-05




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Podpis pooblaščenega osebe / Authorized signature
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Št. / No. *Stran / Page*


ANNEX 1 to Certificate of Test No P223-0002/12

List of Type Test Reports and applied Standards

TYPE TEST REPORT		APPLIED STANDARDS
REPORT No.	Test Domain	
a	b	c
T223-0160/04	Functionality	IEC/EN 60495 (2 nd Edition, 1993-09)
T251-0111/04	EMC	IEC/EN 60495 (2 nd Edition, 1993-09); EN 300 386:2001; EN 55022; IEC/EN 60255-22-1; IEC/EN 61000-3-2 (GOST R 51317.3.2); IEC/EN 61000-4-2 (GOST R 51317.4.2); IEC/EN 61000-4-3 (GOST R 51317.4.3); IEC/EN 61000-4-4 (GOST R 51317.4.4); IEC/EN 61000-4-5 (GOST R 51317.4.5); IEC/EN 61000-4-6 (GOST R 51317.4.6); IEC/EN 61000-4-8 (GOST R 51317.4.8); IEC/EN 61000-4-11 (GOST R 51317.4.11); IEC/EN 61000-4-12 (GOST R 51317.4.12)
T251-0338/05		
T223-0318/09	Safety	IEC/EN 60950-1:2001 (1 st Edition); IEC/EN 60255-5:2000
T223-0318/09, Amendment-2		
T223-0143/04	Environmental Exposures	IEC 60068-2-1 (1990); IEC 60068-2-2 (1974); IEC 60068-2-3 (1969); IEC 60068-2-6 (1995); IEC 60068-2-18 (1989); IEC 60068-2-27 (1987); IEC 60068-2-30 (1980); IEC 60068-2-32 (1982)
T212-0230/10		
		IEC/EN 60721-3-2:1997; IEC/EN 60721-3-3:1995

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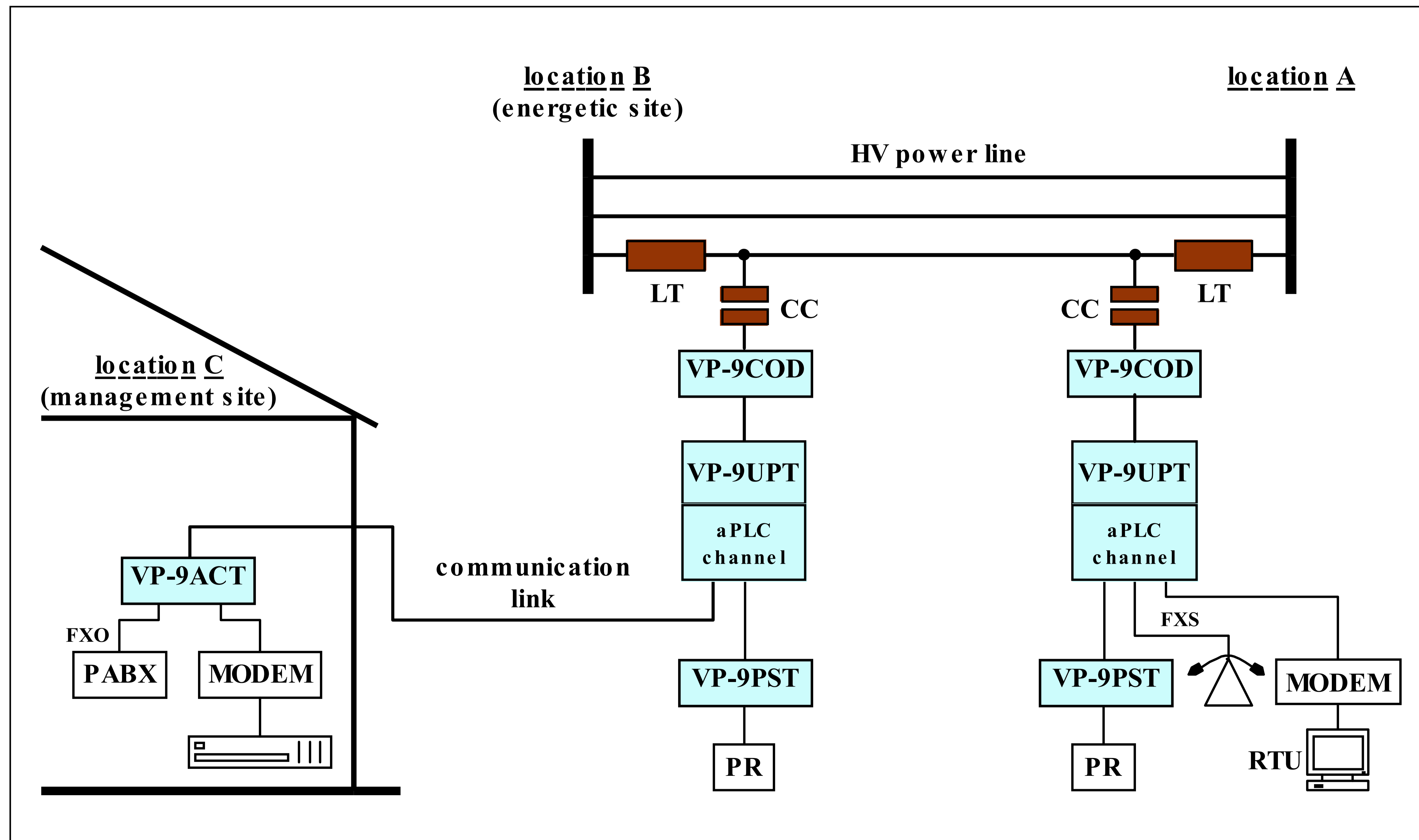




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V-PLC9000 Product Series (5)

Analogue Channel Terminal



V-PLC9000 Product Series ⁽⁵⁾

VP-9PST Teleprotection Signalling Terminal

- F6 modulation; guard tone / command(s) tone
- Up to eight protection commands, transmitted in different priority schemes
- Flexible frequency plan
- Direct trip, permissive trip and blocking protection schemes supported
- Easy integration into any channel of VP-9UPT or into VP-9ACT
- Integrated maintenance speech channel
- IEC 60834-1 (1999-10) compliant

V-PLC9000 Product Series ⁽⁵⁾

Technical Data

- Transmission times:

Direct:	< 20ms
Permissive:	<15ms
Blocking:	<10ms

- Security / Dependability

Direct:	10^{-6} / 10^{-4}
Permissive:	10^{-4} / 10^{-3}
Blocking:	10^{-3} / 10^{-3}

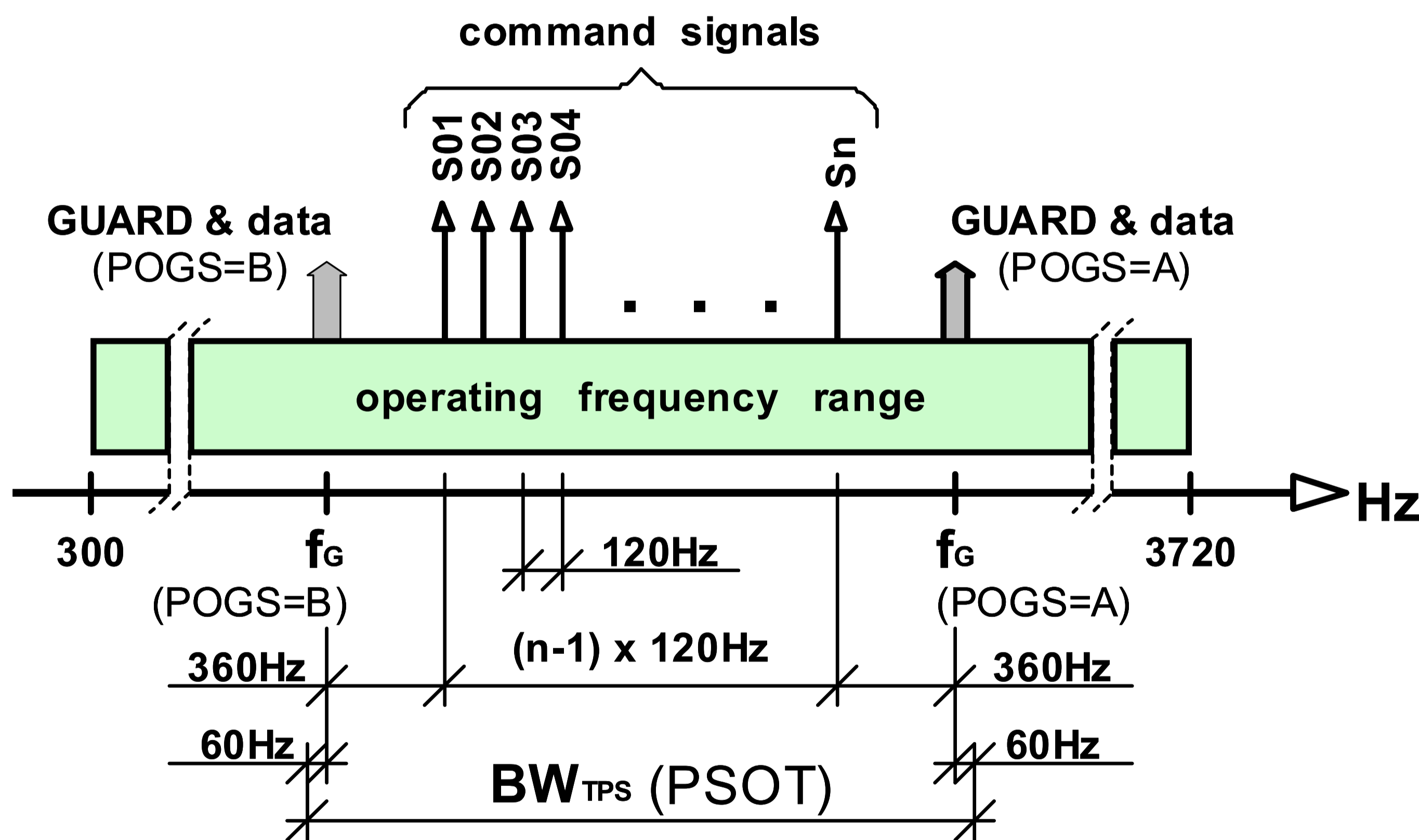
V-PLC9000 Product Series ⁽⁵⁾

Command Transmission Priority

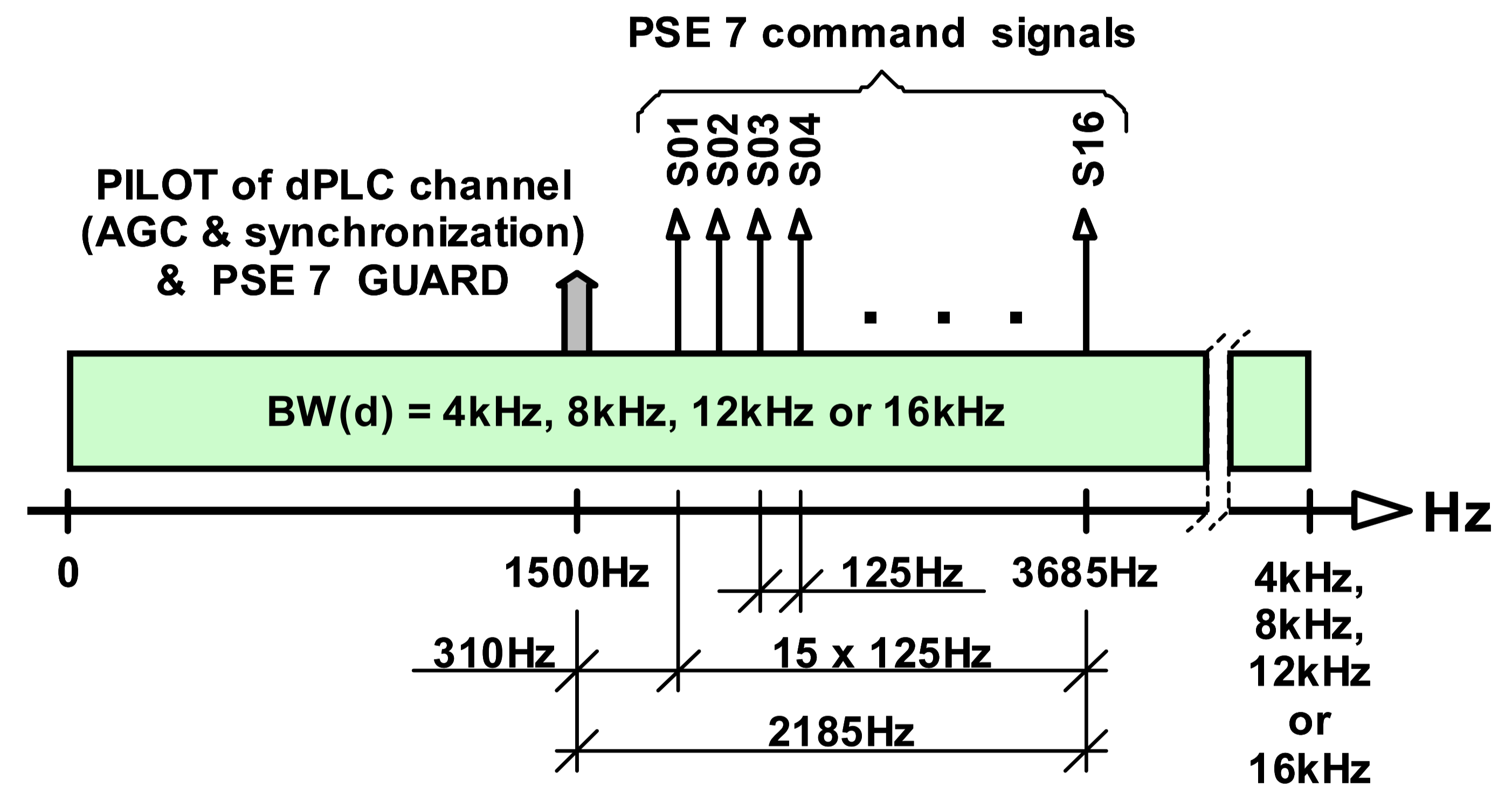
- 3I / 4I three / four independent (no priority) commands
- 6P six commands, transmitted in priority scheme
- 22 two priority groups of commands,
each group contains two independent commands
- 42 four priority groups of commands,
each group contains two independent commands

V-PLC9000 Product Series (5)

Operating Frequency Plan



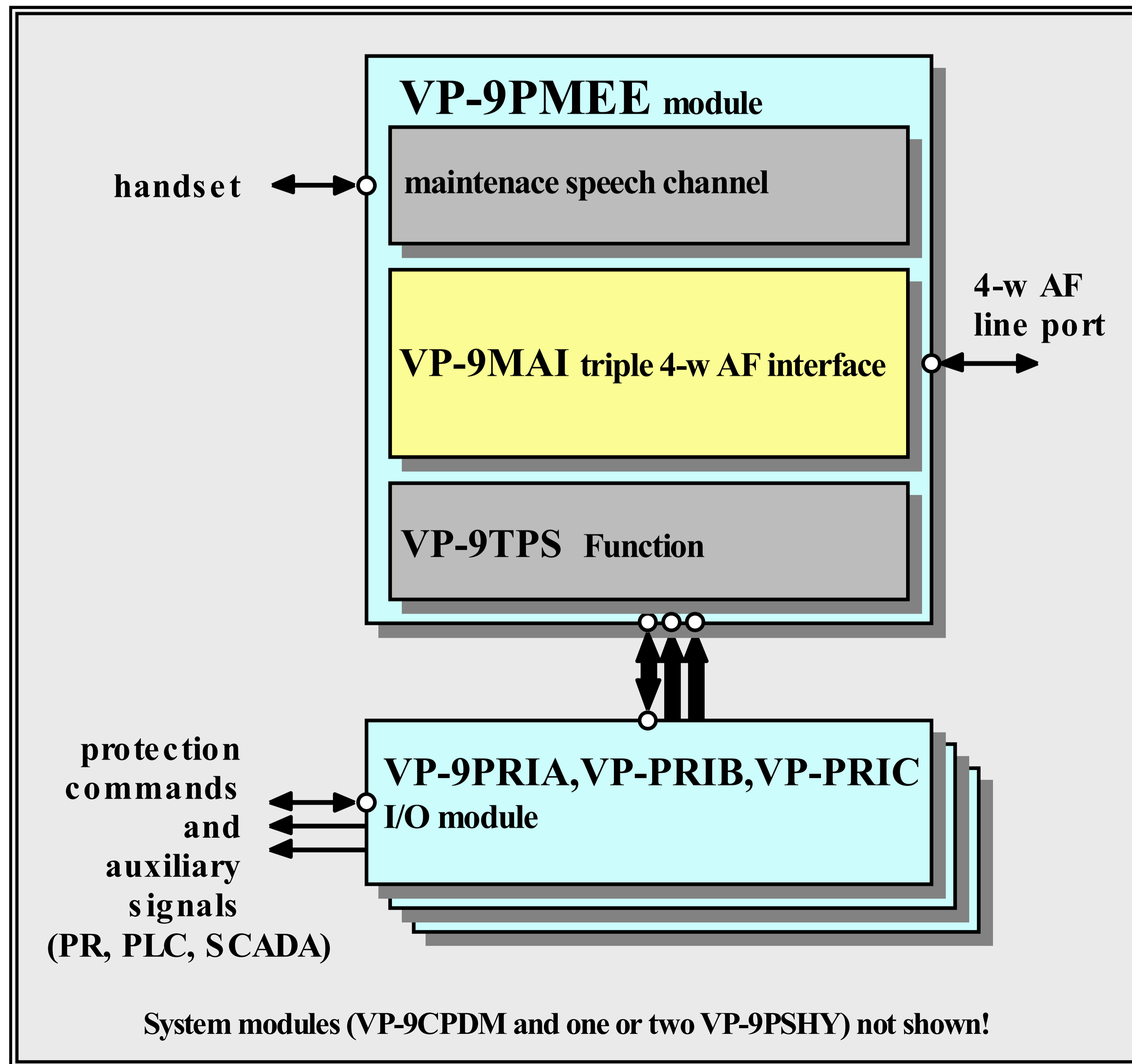
VP-9PST: General frequency plan; $n_{max} = 16$



VP-9PST: Frequency plan – integration into dPLC channel of V-9UPT PLC Terminal

V-PLC9000 Product Series (5)

Teleprotection Block Diagram



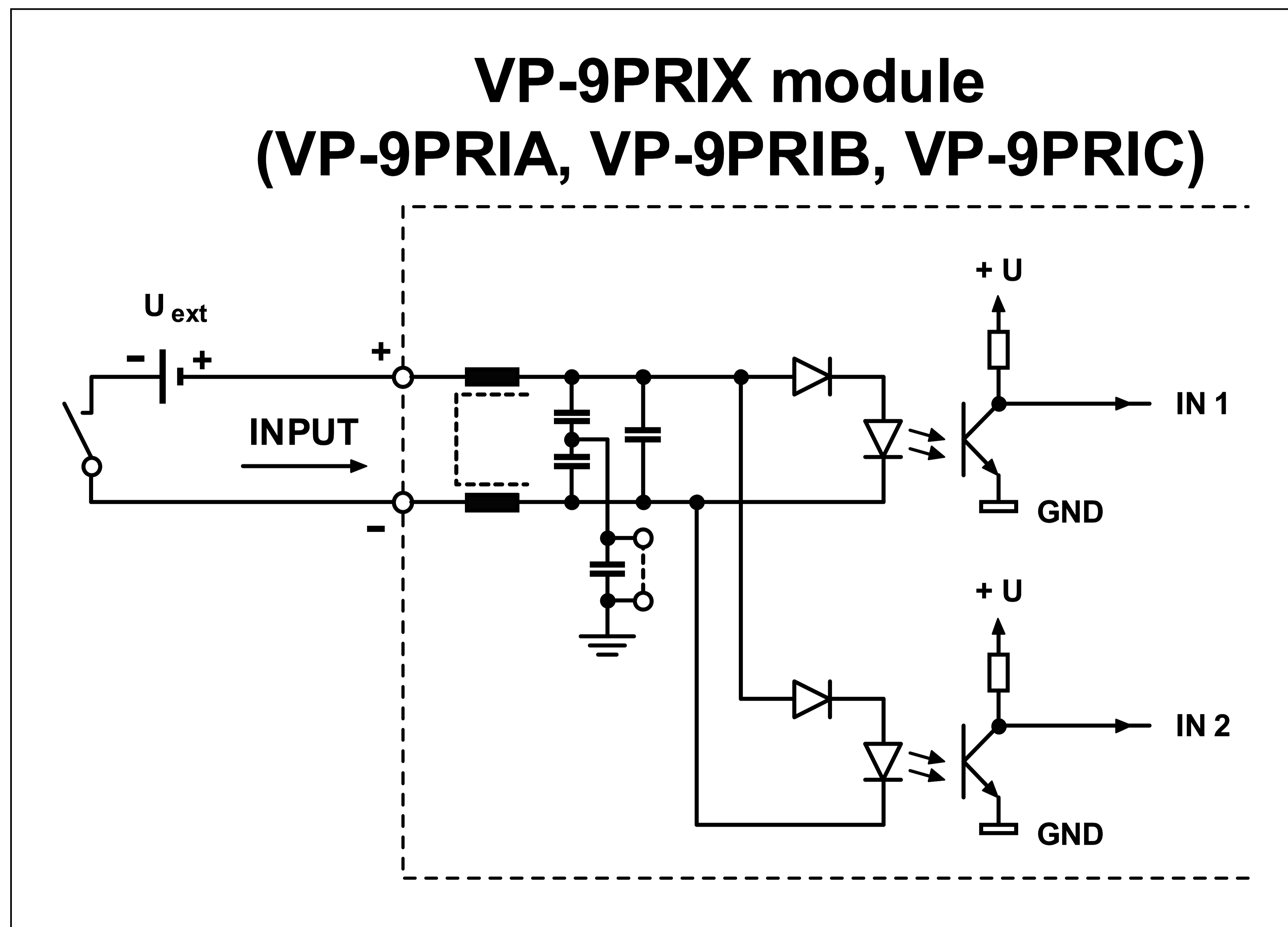
V-PLC9000 Product Series ⁽⁵⁾

VP-9PRIX I/O Module

- Up to three PRIX I/O modules of version VP-9PRIA (2 IN / 6 OUT), VP-9PRIB (4 IN / 4 OUT) and/or VP-9PRIC (6 IN / 2 OUT)
- Universal binary Inputs / Outputs
- Inputs: optocoupler
- Outputs: solid state relay (MOSFET) or electro-mechanical relay (EMR); programmable
- Single component failure protection design

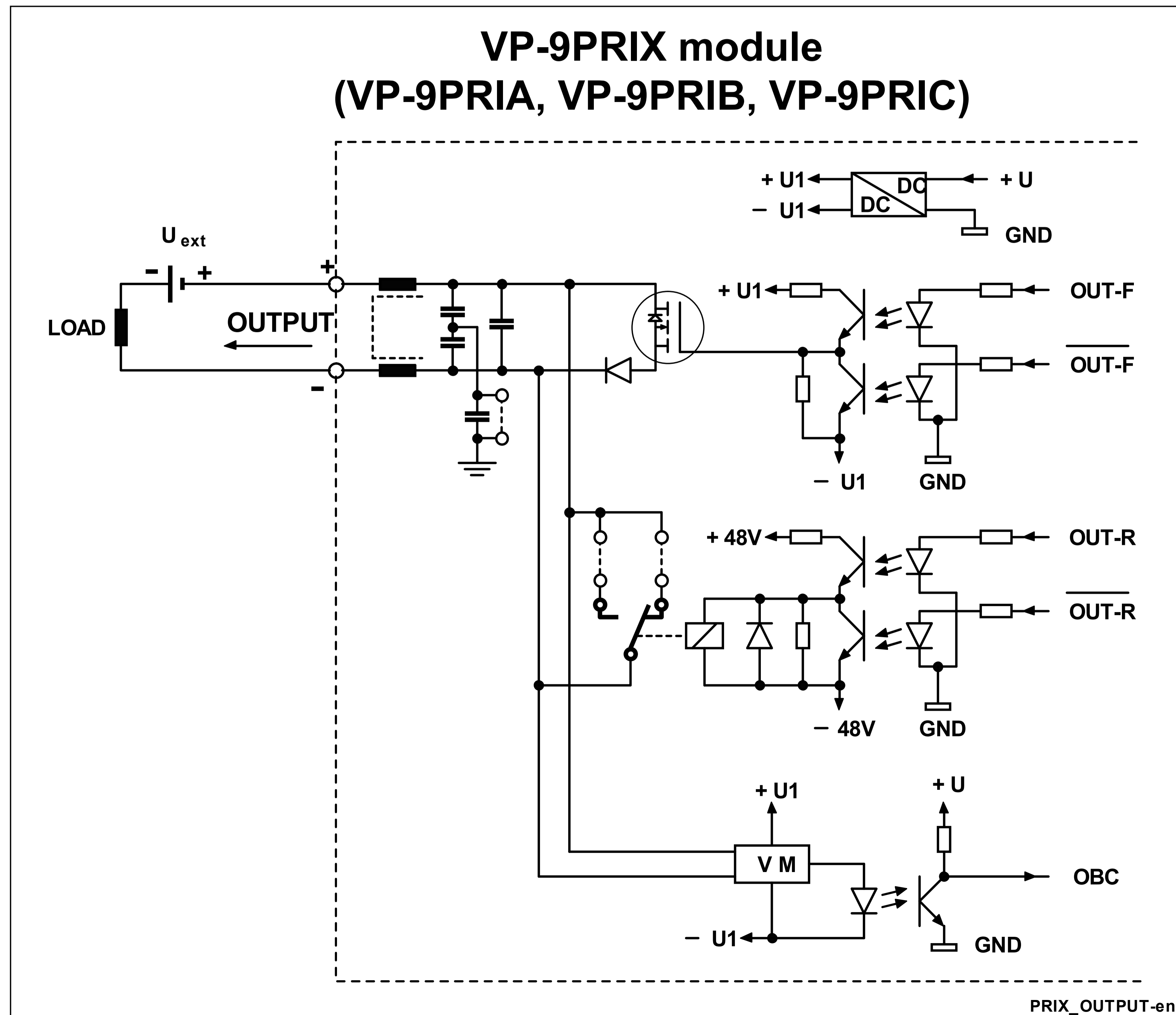
V-PLC9000 Product Series (5)

VP-9PRIX I/O Module – Input Design



V-PLC9000 Product Series (5)

VP-9PRIX I/O Module – Output Design



V-PLC9000, TPS Type Test (5)



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Potrdilo o preskusu / Certificate of Test

Št. / No.
P223-0001/12

Podatki o izdelku / Identification of product

Communication system and Teleprotection Signalling Terminal
Model: V-PLC9000 / VP-9PST

Leto izdelave / Year of manufacture
2011

Proizvajalec / Manufacturer
VEESTA World Company
No. 21, Parastoo Alley, Arasbaran Street, 15416-49911 Tehran, IRAN

Naročnik preskusa / Test ordered by
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Vrsta preskusa in upoštevani standardi/predpisi / Purpose of test and related standard/specifications
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Ljubljana, 2012-01-05




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Št. / No. *Stran / Page*


ANNEX 1 to Certificate of Test No P223-0001/12

List of Type Test Reports and applied Standards

TYPE TEST REPORT		APPLIED STANDARDS
Test Report No.	Test Domain	
a	b	c
T223-0234/06	Functionality	IEC/EN 60834-1 (2 nd Edition, 1999-10)
T251-0065R/06	EMC	EN 300 386:2001; CISPR 22; EN 55022; IEC/EN 61000-3-2 (GOST R 51317.3.2); IEC/EN 61000-4-2 (GOST R 51317.4.2); IEC/EN 61000-4-3 (GOST R 51317.4.3); IEC/EN 61000-4-4 (GOST R 51317.4.4); IEC/EN 61000-4-5 (GOST R 51317.4.5); IEC/EN 61000-4-6 (GOST R 51317.4.6); IEC/EN 61000-4-8 (GOST R 51317.4.8); IEC/EN 61000-4-11 (GOST R 51317.4.11); IEC/EN 61000-4-12 (GOST R 51317.4.12)
T223-0318/09	Safety	IEC/EN 60950-1:2001 (1 st Edition); IEC/EN 60255-5:2000
T223-0318/09, Ammendment-1		
T223-0318/09, Ammendment-2		
T223-0143/04	Environmental Exposures	IEC 60068-2-1 (1990); IEC 60068-2-2 (1974); IEC 60068-2-3 (1969); IEC 60068-2-6 (1995); IEC 60068-2-18 (1989); IEC 60068-2-27 (1987); IEC 60068-2-30 (1980); IEC 60068-2-32 (1982)
T212-0230/10		

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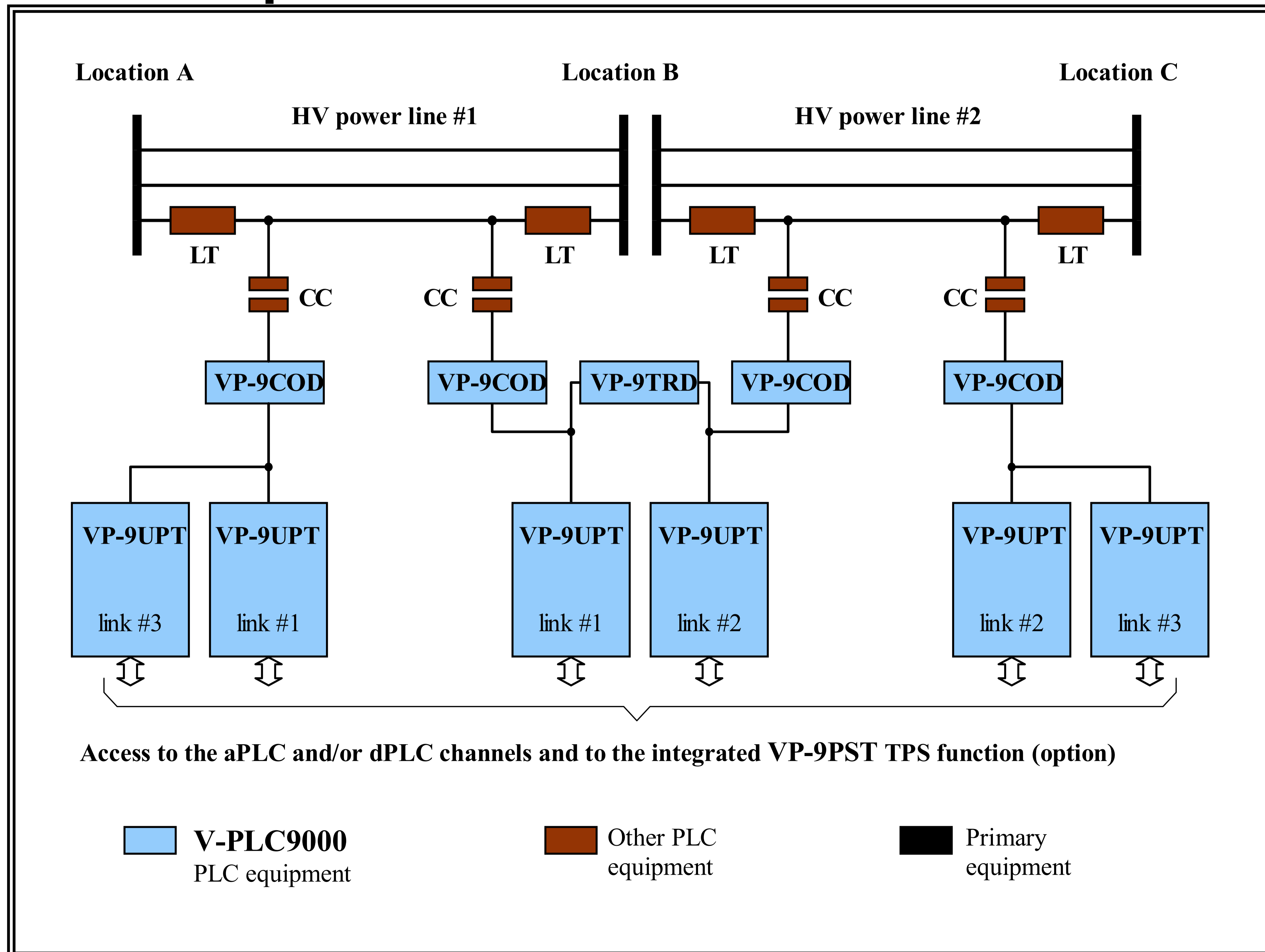




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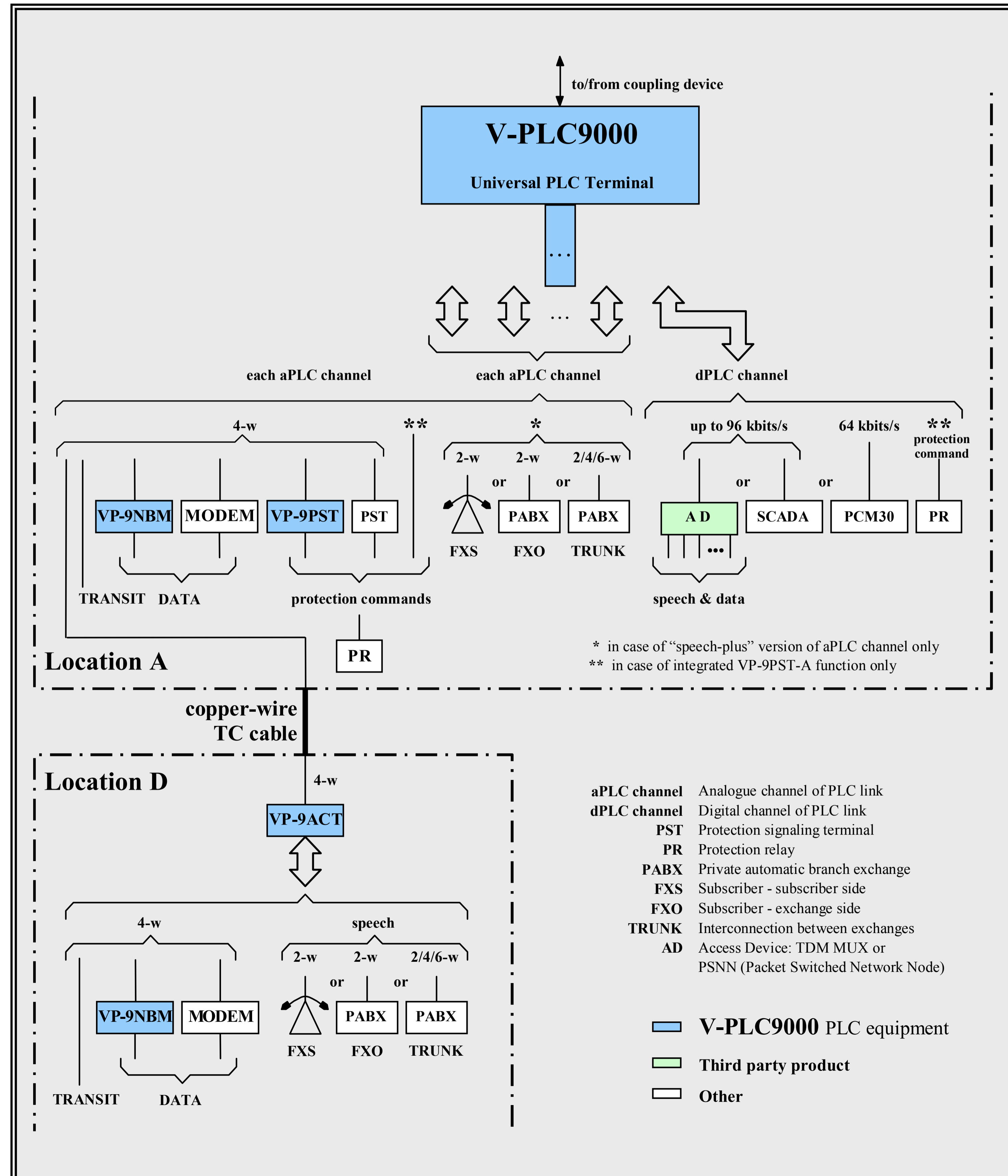
V-PLC9000 Product Series (5)

Application- Example 1



V-PLC9000 Product Series (5)

Equipment Application



V-PLC9000 Q&A

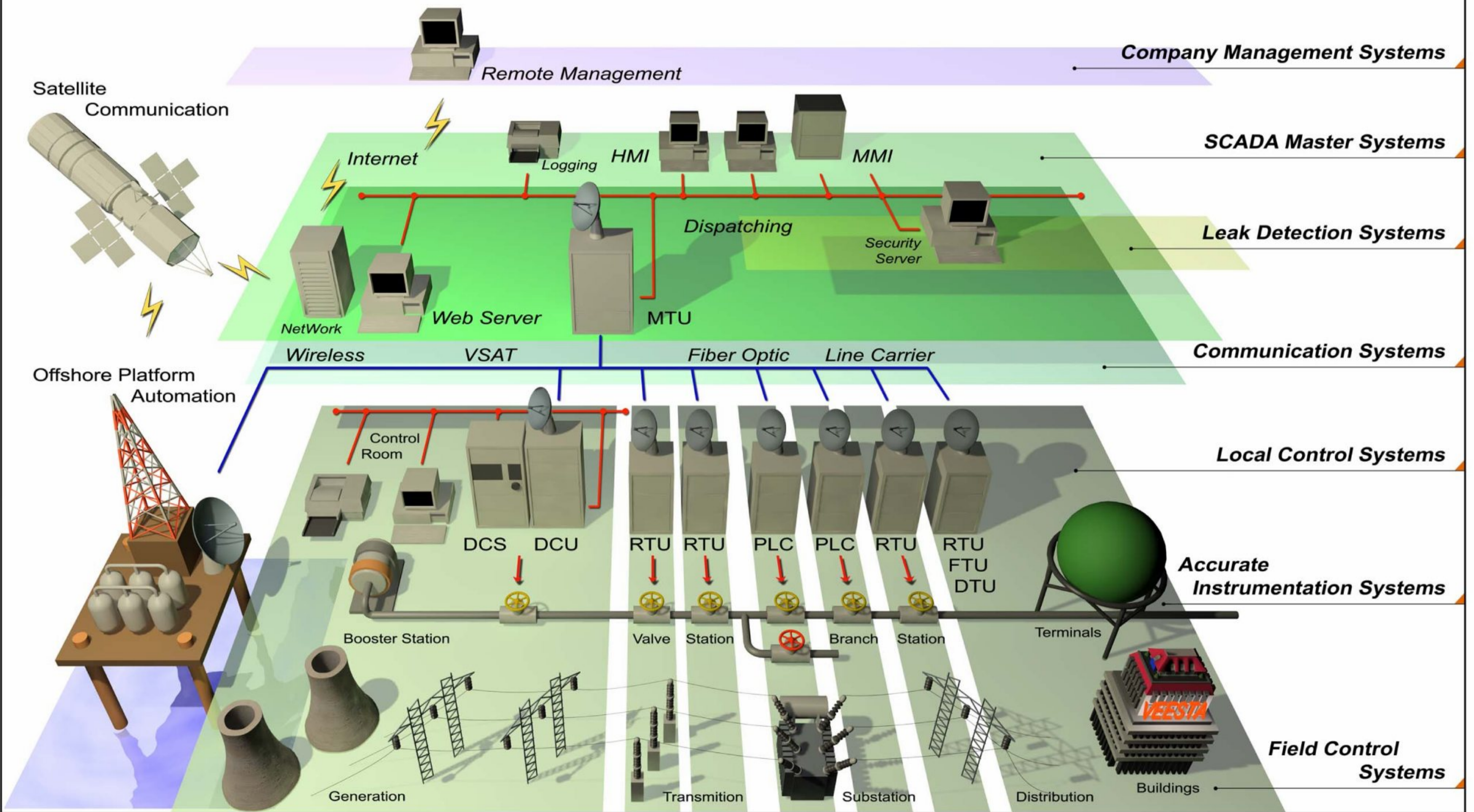
Question & Answer

V-PLC 9000

Veesta-PLC9000
Universal PLC & Teleprotection

Veesta World Company

Veesta World area of practice & products are :



V-PLC 9000

Veesta-PLC9000
Universal PLC & Teleprotection



Thank You

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