



**HIRSCHMANN**

A **BELDEN** BRAND

# User Manual

## General Specifications Dragon PTN



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## 1. INTRODUCTION

### 1.1 General

This document is valid as of Dragon PTN Release 4.0DR.

This document describes the general specification characteristics to which Dragon PTN complies.

### 1.2 References

Table 1 is an overview of the documents being referred to in this document.

**Table 1 References**

Ref.	Document	Title
[1]	UM_BasicConfig_Dragon-PTN_and_HiProvision-Operation_Rel_4-0DR_1019_en.pdf	Dragon PTN and HiProvision Operation
[2]	IG_Dragon-PTN_Installation-and-Operation_02_1019_en.pdf	Dragon PTN Installation and Operation Manual
[3]	IG_Dragon-PTN_Nodes_02_1019_en.pdf	Dragon PTN Nodes: PTN2210, PTN1104, PTN2206, PTN2209
[4]	IG_Dragon-PTN_PTN-CSM310-A_02_1019_en.pdf	Dragon PTN Switching Module: PTN-CSM310-A

## 2. CE MARKING & DIRECTIVES

### 2.1 General

The Dragon PTN product is CE marked as is legally required within the European Union and in compliance with the European Directive 93/68/EC. The CE marking is applied to each node.



**Figure 1 CE Marking**

This means that the Dragon PTN product complies with all European Directives applicable to Dragon PTN, i.e. the EMC directive (Electro Magnetic Compatibility) 2014/30/EU and the Low Voltage directive 2014/35/EU.

## 2.2 Connecting to the Public Telecommunications Network

**CAUTION: Dragon PTN is not intended for being directly connected to a public telecommunications network.**

## 2.3 FCC (Federal Communications Commission) Regulations

Hirschmann Automation and Control GmbH declares that Dragon PTN complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device must not cause harmful interference, and (2) it must accept any interference received, including interference that may cause undesired operation. It complies with FDA radiation performance standards, 21 CFR subchapter J.

**CAUTION: This equipment complies with the limits for a digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection from harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his expense.**

## 3. CHARACTERISTICS

**CAUTION: The characteristics in the tables below are valid if the installation has been done according the directives listed in §2.**

**Table 2 Characteristics**

Name	Description	Specification
Utility design	Ruggedized design	Extended temperature range: -30° to +65°C (-22° to 149°F)
		Compact design (19" or DIN Rail mountable)
		Cu and fiber optic connectivity
		Alarm contacts for local alarm triggering or forwarding of local alarms
		Legacy and Ethernet connectivity
	Availability and scalability	Hot pluggable power supplies
		50ms automatic protection switching (MPLS-TP)
		Hot pluggable interface boards
		Dual CSM for highest availability designs
		100% traffic engineering of services
MPLS-TP service types	E-LINE	Point to point service (VPWS)
	E-LAN	Multipoint (VPLS)
	Ring	Logical Ethernet Ring
	Protection schemes	1:1, Hitless Switching, ERP logical rings

Name	Description	Specification
Ethernet capabilities	L2 Ethernet aggregation	MSTP (multiple spanning tree)
		Multicast handling through IGMP
		Virtual forwarding instances
		VLAN handling
		Broadcast and multicast storm control
	QoS	3 level hierarchical scheduler
		4k Flexible queues
		2 rate, 3 color ingress policing
		802.1p priority evaluation (VLAN priority)
		Differential services based on IP header
		Handling of priority queues Strict Priority Based, Weighted Deficit Round Robin scheduling
Network security	Node	IEEE 802.1x authentication (RADIUS)
		Access control lists based on MAC and IP addresses (black/white list)
		IPsec encryption of the DCN traffic
		Connection oriented network
		Disable unused ports
		Connection oriented network (logical separation of services)
	HiProvision	Radius authentication for client server operation
Manageability	Monitoring and configuration	Auto provisioned and auto setup DCN for management
		SNMP v3
		Management port on each CSM module
		2 input contacts allowing forwarding of local alarms to the HiProvision platform
		2 output contacts for local triggering of alarms
		Removable memory allowing easy replacement of CSM in the field
		OAM
	Automatic protection switching via BFD	
	Performance monitoring based on Y.1731 Loss and Delay	

**Table 3 EMI Immunity/Emission**

Main Test	Test2	Port Type	Test Levels	Class
ESD contact	61000-4-2 C37.90.3	Enclosure	± 2kV, ± 4kV, ± 6kV, ± 8kV	class 1B

Main Test	Test2	Port Type	Test Levels	Class
ESD air		Enclosure	± 2kV, ± 4kV, ± 8kV, ± 15kV	class 1B
Radiated RFI	61000-4-3	Enclosure	35V/m modulated (peak), 80 MHz - 3.8 GHz	class 2A
	C37.90.2	Enclosure	Keying test: 20V/m Pulse Modulated 100% 0.5s on 0.5s off	class 2A
		Enclosure	Spot frequency test: 20V/m, for < 900 MHz 80% AM, for 900 MHz PM 50% @ 200 Hz	class 2A
Burst (Fast Transient)	61000-4-4 C37.90.1	Signal	± 4kV common mode, 5/50ns, 5kHz (SHDSL@100kHz)	class 1B
		Power	± 4kV common/ differential mode, 5/50ns, 5kHz	class 1B
Surge	61000-4-5	Signal	± 4kV line-to-earth (1.2/50µs , 10/700µs)	class 2A
		AC Power	± 4kV line-to-earth, ± 2kV line-to-line (1.2/50µs)	class 2A
		DC Power	± 2kV line-to-earth, ± 1kV line-to-line (1.2/50µs)	class 2A
Conducted (induced) RFI	61000-4-6	Signal	10Vrms 80% AM (1kHz), 0,15 - 80 MHz	class 2A
		Power	10Vrms 80% AM (1kHz), 0,15 - 80 MHz	class 2A
Power frequency magnetic field	61000-4-8	Enclosure	100 A/m continuous	class 2A
			1000 A/m 1s	class 2A
Damped oscillatory magnetic field	61000-4-10	Enclosure	100 A/m continuous, 100kHz and 1MHz	class 1B
Voltage dips & Interrupts	61000-4-11	AC Power	30% and 100% for 1 period	class 2A
			60% for 50 periods, 30% for 25/50 periods	class 1C
			100% for 5, 50, 250 and 500 periods	class 1C
Voltage dips & Interrupts	61000-4-29	DC Power	30% for 100 ms	class 2A
			60% for 100 ms	class 1C
			100% for 50 ms	class 1C
Mains frequency voltage	61000-4-16	Signal	30 V continuous	class 2A
			300 V 3s	class 2A
		DC Power	30 V continuous	class 2A
			300 V 3s	class 2A
Ripple on DC Power Supply	61000-4-17	DC Power	10% of nominal voltage	class 2A
			5% of 80% to 110% of nominal voltage	class 2A
Damped oscillatory wave	61000-4-18	Signal	2.5 kV common mode, 1 kV differential mode @ 1MHz	class 1B
		Power	2.5 kV common mode, 1 kV differential mode @ 1MHz	class 1B
High Voltage Impulse	IEEE 1613 IEC 60255-27	Signal ports rated > 50V	5 kV	
		Signal ports rated < 50V	1 kV	
		Power	5 kV	
Radiated emission	EN 55022	Enclosure	class B	class B
	FCC part 15	Enclosure	class B	class B

Main Test	Test2	Port Type	Test Levels	Class
Conducted emission	EN 55022	AC power	class B	class B
		Signal	class B	class B
	EN 61000-6-3	DC Power (System PSU DCP-A, DCP- B)	class B	class B
		DC Power (Power over Ethernet supply DCPoE-A)	class A	class A

**Table 4 Environmental**

Main Test	Test2	Port Type	Test Levels	Class
Operating temperature		Enclosure	-30 to +65°C (fanless) (-22° to 149°F)	Class 1
Operating temperature: cold	60068-2-1	Enclosure	-30°C (-22°F) Ad	Class 1
Operating temperature: dry heat	60068-2-2	Enclosure	+65°C (149°F) Bd	Class 1
Non-operating temperature: cold	60068-2-1	Enclosure	-30°C (-22°F) Ab	Class 1
Non-operating temperature: dry heat	60068-2-2	Enclosure	+75°C (167°F) Bd	Class 1
Humidity (damp heat cycle)	60068-2-30	Enclosure	95% (non-condensing), 25° (77°F) - 40°C (104°F) , 6 cycles Db var 1	Class 1
Vibration (stationary, sinusoidal)	60870-2-2	Enclosure 19"	2-9Hz (3mm) , 9-200Hz (10m/s21g), 200-500Hz (15m/s2 1,5g) Bm	Class 1
		Enclosure DIN rail with heavy duty kit	9-200Hz (10m/s21g) , 200-500Hz (15m/s2 1,5g) Bm	Class 1
Vibration (response test)	60255-21-1	Enclosure (19" & DIN rail with heavy duty kit)	10Hz-150Hz (X-over freq. 58-60Hz) - 1swp/axis - 1oct/min	Class 1
			Pk displacement 0,035mm < X-overf , Pk acc 1g > X-overf	Class 1
Vibration (endurance test)	60255-21-1	Enclosure (19" & DIN rail with heavy duty kit)	10Hz-150Hz - 20swp/axis - 1oct/min - 1g constant	Class 1
Shock (withstand test)	60255-21-2	Enclosure (19" & DIN rail with heavy duty kit)	Pk acc 15gn - Pulse duration 11ms - 6 pulses/axis (+ and -)	Class 1
	60870-2-2	Enclosure (19" & DIN rail with heavy duty kit)	Pk acc 10gn - Pulse duration (half sine) 11ms - 6 pulses/axis (+ and -) Bm	Class 1
	60068-2-27	Enclosure (19" & DIN rail with heavy duty kit)	Pk acc 15gn - Pulse duration (half sine) 6ms - 200 pulses/axis (+ and-) Ea	Class 1
Shock (free fall)	60870-2-2	Enclosure	25cm Bm	Class 1
	60068-2-32	Enclosure	25cm Bm	Class 1
	IEEE 1613	Enclosure	25cm Bm	Class 1

#### 4. ABBREVIATIONS

**AIS** Alarm Indication Signal



<b>CE</b>	Conformite Europeene
<b>CESoPSN</b>	Circuit Emulation Service over Packet
<b>CSM</b>	Central Switching Module
<b>EFM-C</b>	Ethernet in the First Mile Over Point-to-Point Copper
<b>EMI</b>	Electromagnetic Interference
<b>ERR</b>	Error
<b>FLT</b>	Fault
<b>IEEE</b>	Institute of Electrical and Electronics Engineers
<b>IFM</b>	InterFace Module
<b>LAN</b>	Local Area Network
<b>LOS</b>	Los Of Signal
<b>LVD</b>	Low Voltage Directive
<b>MSB</b>	Most Significant Bit
<b>MTBF</b>	Mean Time Between Failures
<b>NTR</b>	Network Timing Reference
<b>OAM</b>	Operations, Administration and Maintenance
<b>PAF</b>	PME Aggregation Function
<b>PF</b>	Power Failure
<b>PI</b>	Power Input
<b>PME</b>	Physical Medium Entities
<b>PTN</b>	Packet Transport Network
<b>SAToP</b>	Structure Agnostic TDM over Packet
<b>SyncE</b>	Synchronous Ethernet
<b>WAN</b>	Wide Area Network