farsouth networks

Comma iTA

Installation Guide

Version 1.3, 30 March 2017

Document History

Version	Date	Description of Changes
1.0	2009/01/31	First release
1.1	2009/05/13	Update for protection mechanisms
1.2	2010-02-11	Logo update
1.3	2017-03-29	Update for 6 slot iTA

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1 Introduction

1.1 Document Scope

This document describes the means of physical interconnection between the Comma iTA and the various telecom networks at the wiring level.

The document provides recommended line protection mechanisms and specified classes of device that should be used to provide adequate surge protection.

Refer to “comma-functional description-1.0.pdf” for a more detailed functional description of the Comma iTA.

2 Interconnection methods

2.1 Telco connection mechanism

Figure 1 below provides diagram describing the typically recommendation methods of interconnecting the Comma iTA to the various telecom networks.

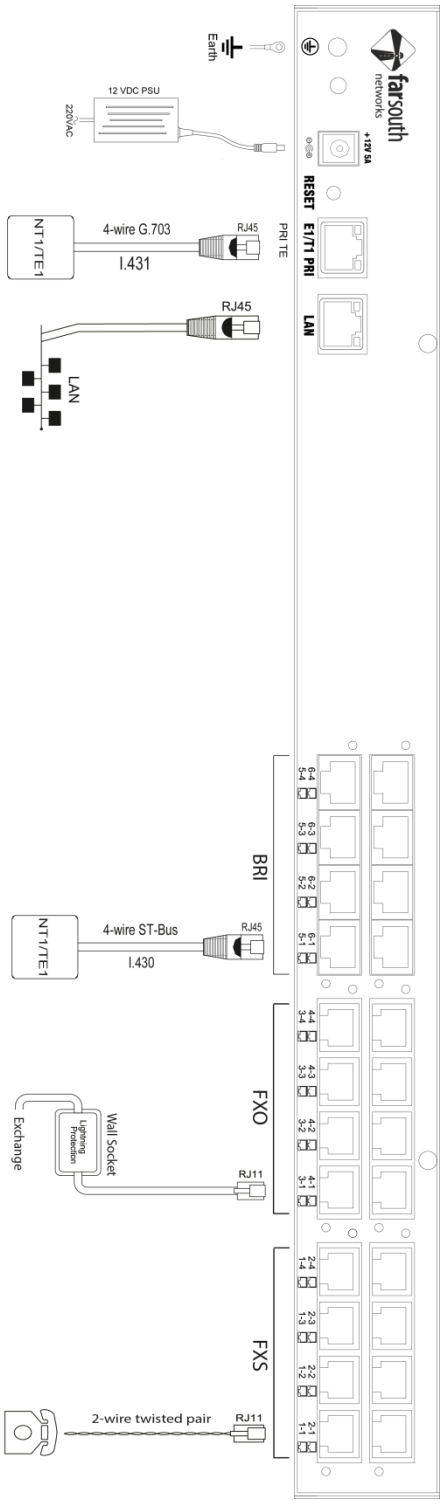

Figure-1: Comma iTA interconnection mechanism

3 Surge protection mechanisms and recommendations

3.1 Comma iTA surge protection specifications

The Comma iTA provides the following surge protection levels on the available telecom interfaces:

- Analogue (FXS & FXO) – secondary (intra-building protection)
- PRI – secondary (intra-building protection)
- BRI – 1500V isolation (standard BRI S/T cables)
- Ethernet – 1500V isolation (CAT5 or better)

The Comma iTA is designed to support secondary (intra-building) surge protection standards ONLY. Where cables connected to Comma iTA FXS and FXO ports may be exposed to extra-building environments, suitable primary surge protection mechanisms MUST be utilised. Refer to section 3.3 below for further details.

Far South Networks DOES NOT recommend installation of PRI, BRI or Ethernet ports with cabling exposed to extra-building conditions.

3.2 Surge protection for Comma iTA analogue interface

3.2.1 Overcurrent protection

A telefuse device is used to guarantee fire safety in the event of power cross events. These devices do not recover after activation, i.e. the circuit goes open in response to an overcurrent. Unit replacement or repair will be required after such an occurrence.

3.2.2 Overvoltage protection

Electronic components have been designed to function properly when used within their specified current and voltage ratings. When these ratings are exceeded during operation, the component may sustain permanent damage and the equipment may cease to operate.

Solid-state thyristor overvoltage protection devices are provided to afford standards-compliant secondary protection. These devices are designed to switch rapidly from a high to a low impedance state in response to an overvoltage surge, conducting the surge to chassis ground and away from the vulnerable components.

In telecommunication applications, the major sources of overvoltage conditions are lightning, AC power lines, and ground shifts. Thyristor surge suppressors are used as shunt devices, conducting large currents away from sensitive electronic devices, when their threshold voltage is exceeded.

Good earthing practice is vital to ensure the effectiveness of these protection devices.

3.2.3 FXO interface protection circuit

The FXO port line interface circuit is shown below.

Both overcurrent and overvoltage devices are provisioned on each line interface.

The overvoltage protection device, Littlefuse P3100, will clamp at V(drm) = 275V

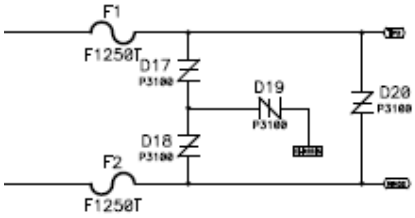

Figure-2: FXO port circuit example

Primary protection must be provided externally.

3.2.4 FXS interface protection circuit

The FXS port line interface circuit is shown below.

Both overcurrent and overvoltage devices are provisioned on each line interface.

The overvoltage protection device, Littlefuse P1301, will clamp at V(drm) = 120V

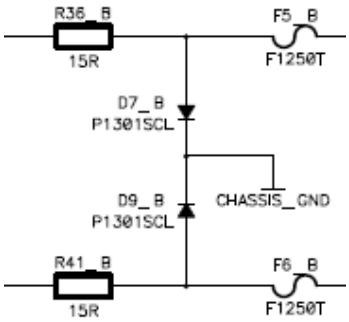

Figure-3: FXS port circuit example

Primary protection must be provided externally if the wiring leaves the premises.

3.3 Primary Surge protection

Primary surge devices are provisioned externally to the Comma iTA, to provide co-ordinated protection for the Comma interfaces in conjunction with the secondary protection that is built into the Comma iTA.

Comma iTA does NOT support primary protection levels for interfaces exposed to outdoor environments.

Far South Networks recommend installation of primary surge protection devices (GDT – Gas Discharge Tube) installed on all analogue lines exposed to extra-building conditions.

These devices are described below.

3.3.1 FXS interface

Voltage = 130Vdc, transient = 10kA 8/20, response <25nS

Recommended part:

Clearline KP1HS (12-00663) – single line solution

Clearline KP2HS (12-00196) – 10 line solution

Surgetek: DPL 10F/TEL-ISDN – 10 line solution

Surgetek: Tel/Fax-ISDN RJ11 – single line solution

Bourns: 2036-15 – discrete 3 electrode GDT

3.3.2 FXO interface

Voltage = 230Vdc, transient = 10kA 8/20, response <25nS

FXO:

Voltage = 230Vdc 10kA 8/20, <25nS

Recommended part:

Clearline KP1HS (12-00621) – single line solution

Clearline KP2HS (12-00230) – 10 line solution

Surgetek: DPL 10F/TEL-ISDN – 10 line solution (230V version required)

Surgetek: Tel/Fax-ISDN RJ11 – single line solution (230V version required)

Bourns: 2036-23, – discrete 3 electrode GDT

3.4 Surge protection wiring platforms

On very large systems, the main distribution frame (MDF) is usually situated some distance away from the PABX equipment. The power surge arresters are usually located in a distribution board some distance away.

The MDF backframe is used as the protection platform typically containing “krone-style” connection blocks with primary surge arrester mounted thereon. An earth point is then created as close as possible to the surge arresters and the electrical, building and other earths are then connected to this point. Refer to the figure below that captures this star chassis grounding mechanism.

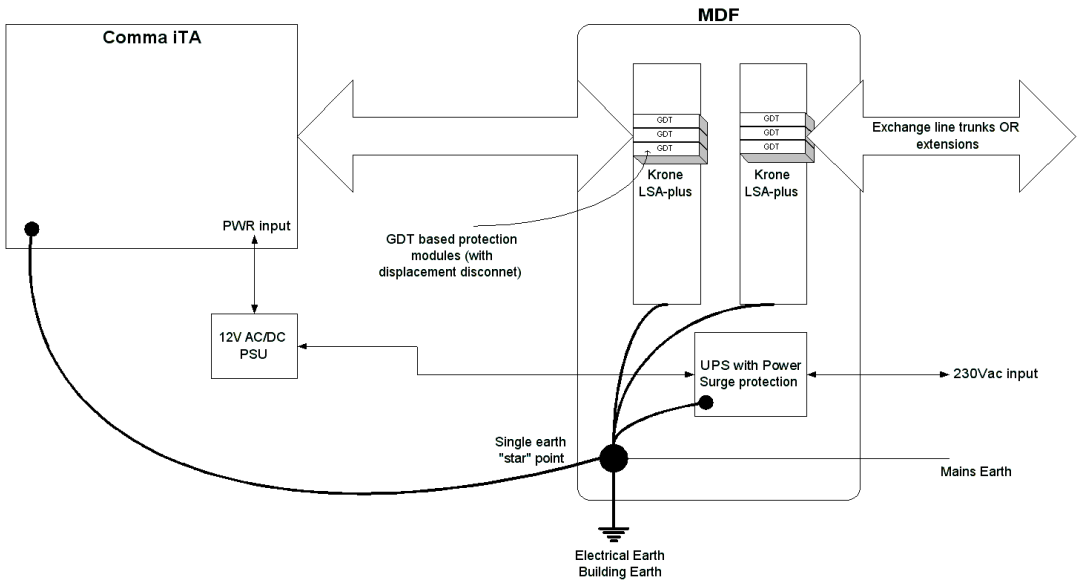

Figure-4: MDF backframe & Comma iTA earth connectivity