

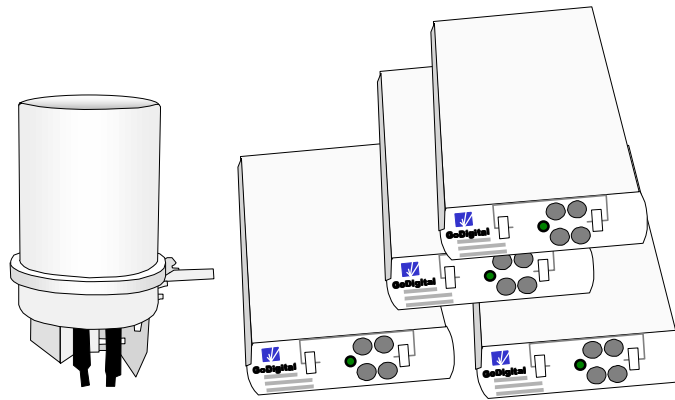
### 1. Purpose and Overview

This document provides installation instructions for each STR MOD or “STRM”. This document is provided with each STRM shipped to customers and is also available separately. In addition, an up to date copy is included as an attachment to the *System Practice* with each XCel/GDSL COT Shelf shipped. GoDigital recommends that one copy of the complete *System Practice* be kept in each Central Office that is equipped with XCel/GDSL Systems.

### 2. Products

This Installation Note is relevant for the following GoDigital products:

System / Product Name	Part #	Description
<b>XCel-8, GDSL-8 and GDSL-3i Systems</b>		
STR MOD 544	990102-A	Straight Through Repeater Module for XCel/GDSL-8 & GDSL-3i
<b>XCel-12 Systems</b>		
STR MOD 784	990150	Straight Through Repeater Module for XCel-12
<b>XCel-4a Systems</b>		
STR MOD 4A 1536	990286	Straight Through Repeater Module for XCel-4a



### 3. Overview

The STRM is a Straight Through Repeater plug in Module for a XCel/GDSL System and is designed to fit in any industry standard, 239 mechanics, indoor shelf outdoor housing. Please consult your 239 repeater housing manufacturer’s detailed instructions and diagrams for slot, and OSP cable pair and grounding pin assignments.

### 4. Engineering and Installation Steps

1. Verify that the loop has been designed in accordance with the GoDigital Configur8r™ System Design tool, with the proper loop span reach, and drop requirements.
2. Prior to installing the STRM unit, verify that the capacity of the housing is in accordance with GoDigital recommended loading levels for heat dissipation. See Sections 10 and 11.
3. Verify that the Housing is properly grounded to earth ground. See Paragraph 5.
4. Verify the upstream and downstream DSL pairs for the slots that will support each STRM to be installed. See Section 6.
5. Verify that protectors have been installed in the housing for the upstream and downstream DSL pairs to be used.
6. Insert the STRM into the appropriate slot.
7. After the loop is completely built, apply power by seating the CTU in the Central Office.
8. The STRM will automatically link in the standard XCel/GDSL linking process.

### 5. Grounding

- 5.1 Properly ground the unit using the proper ground connection in the housing and be sure to follow the housing manufacturers recommended grounding practices.

# Installation Note

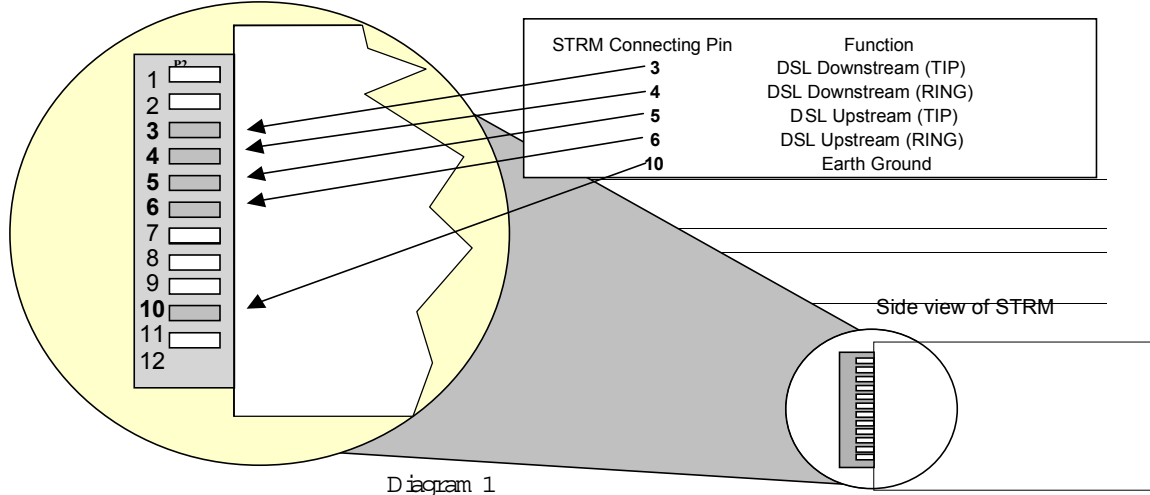
## Straight Through Repeater Module (STR MOD)

**CAUTION:** The manufacture of the 239 mechanics housing should provide external gas tube or solid state lightning protection to meet GoDigital Specifications and Warranty requirements.

**CAUTION:** Outside plant units not properly grounded will be damaged as a result of lightning induced voltage surges. Insure proper ground of 25 ohms or less resistance for each outside plant unit for proper operation and lightning protection. Attach the ground to a properly installed ground rod. Units not properly grounded are not covered by warranty.

**CAUTION:** Do NOT use a cable sheath ground to ground OSP devices. The ground must be established to a properly installed ground rod.

- 5.2 The STRM uses pin 10 for connection to earth ground in typical 239 enclosures. The STRM requires a 25 ohm resistance or less, equipment to earth ground.
- 5.3 Verify that the ground established is in accordance with standard and local practices with respect to the OSP element, the ground wire clamp and the earth ground rod.
6. **Upstream and Downstream connections**



The STRM uses pins 5 and 6, in typical 239 enclosures, for the upstream Tip and Ring terminations. The STRM uses pins 3 and 4, in typical 239 enclosures, for the downstream Tip and Ring terminations. Please see Diagram 1 for illustration.

**NOTE:** The STRM conforms to the Standard 239 pin outs and the “second” pair normally assigned to 4-wire T1 lines (defined in the standard) is a “No Connect” (i.e. left open) in GoDigital's STRM repeater units. If it is desired or required to wire the “second” pair “through” a repeater location, then it can be spliced or jumped (by the craftsperson) at the repeater location.

### 7. Identification of upstream and downstream DSL cable pairs

**NOTE:** The XCel/GDSL system is not sensitive to Tip and Ring polarity.

- 7.1 If you do not know which cable pair goes toward the central office (Upstream) you can:
- Request that the system be powered up in the office and look for the presence of the DSL powering voltage on the upstream pair, or
  - Request the upstream pair be shorted and use your Volt/Ohm meter to detect the correct pair.

**NOTE:** It is important that the UPSTREAM and DOWNSTREAM connections be made to the correct pairs. If not, the unit will give an indication that it is trying to link, but it will never link.

### 8. Turn-up and Link-up

Once the Upstream and Downstream DSL pairs are properly connected and the loop is powered by the XCel/GDSL Central Office Terminal Unit (CTU), the linking process will start. The STRM will attempt to link with the upstream and next downstream element. If the loop or span is within specified distance limitations and is free of load coils the linkup will be completed typically within 3 minutes. Allow 5 minutes for link-up with XCel-8 and XCel-12 Systems, and allow 10 minutes with the XCel-4a System before beginning troubleshooting.

8.1 If no other Upstream elements (either, STR, STRM, or ADR) exists between the STRM and the Central Office the following LED condition can be observed:

- **LED Indication:** The LED will BLINK ON and OFF (1 per second) for approximately 5 minutes.
- The STRM will power down (LED will be OFF) for 10 seconds.
- The linking process will begin again after the 10-second power down period and continue to repeat until reversal is cleared.

8.2 If one or more Upstream or a Downstream elements (either, STR, STRM, or ADR) exist and is connected in the DSL loop:

- **LED Indication:** The LED will BLINK ON and OFF (1 per second) continuously.
- There will be no power down cycle.

**NOTE: This is the same LED indication that will be seen if the loop distance is too great or if a load coil exists in the DSL loop.**

### 9. LED indications

The Green LED in the faceplate of the STRM unit displays three states for installation and troubleshooting support.

Green LED Indication	Description
<b>BLINKING two (2) times per second, constant rate</b>	The unit detects a signal from an upstream element and is attempting to link.
<b>STEADY ON</b>	The unit is linked with an upstream element.
<b>STEADY, but WINKS OFF once every five (5) seconds</b>	Linked upstream but not linked downstream.

### 10. GENERAL GUIDELINES for STRM Capacity, Fill and Loading in 239-Type Housings

Based on the power consumption of the STRM and also on all test results, it is ALWAYS the case that loading STRM modules to the same density as HDSL modules is conservative. The GENERAL GUIDELINES for loading GoDigital's STRM modules in 239 type housings are provided in Table 10-1.

**Table 10-1  
GENERAL GUIDELINES for Recommended STRM Loading in 239-Type Housings**

1. If a housing **HAS BEEN TESTED** or reviewed by GoDigital, the STRM fill or loading level can be in accordance with those test results. Some of these housings can support a 100% fill level. See Tables in Section 11 of this document for loading in specific housings.
2. If the specific housing has **NOT BEEN TESTED** with the XCel/GDSL STRM module for specific fill levels, it is ALWAYS safe to use a STRM fill level that is **as great as the recommended fill or loading for HDSL repeaters or doublers**, in accordance with housing manufacturer's recommendations.
3. If the specific housing has **NOT BEEN TESTED** and **NO RECOMMENDATIONS** for fill of HDSL repeaters/doublers are provided by the housing manufacturer, it still is always safe to use a STRM fill level that is **Half the fill that is recommended for T1 repeaters**

# Installation Note

## Straight Through Repeater Module (STR MOD)



### 11. STRM Approved Capacity Loading in SPECIFIC INDUSTRY HOUSINGS

Because STRM modules generate about half the heat of HDSL modules, denser loading is appropriate in many if not most situations. GoDigital maintains a listing of approved housings and configurations, when housing manufactures have submitted data confirming the performance of their housings with STRM units in various configurations. These listings are presented in the following tables.

#### 11.1 ANTEC MANUFACTURING, Housings

**Table 11-1**  
**ANTEC MANUFACTURING**

ANTEC Models	ANTEC Part Number	Com Code	ANTEC Features & Description	GoDigital Approved STRM Module Capacity
<b>12 Slot - 809A3 Pole Mounted Repeater Cases</b>				
809A3	RF809A3-025	104391297	12 Slot - 809A3 Vented Protected Filled Repeater Case	8
	RF809A3-030	406130419	12 Slot - 809A3 Vented Protected Filled Repeater Case	8
	RF809A3-035	405842741	12 Slot - 809A3 Vented Protected Filled Repeater Case	8
	RF809A3-040	406265025	12 Slot - 809A3 Vented Protected Filled Repeater Case	8
	RF809A3-045	406265033	12 Slot - 809A3 Vented Protected Filled Repeater Case	8
	RF809A3-050	405843244	12 Slot - 809A3 Vented Protected Filled Repeater Case	8
<b>12 Slot – 809B3 Pedestal Mounted Repeater Cases</b>				
809B3	RF809B3-025	104391305	12 Slot - 809B3 Vented Protected Filled Repeater Case	8
	RF809B3-030	106469000	12 Slot - 809B3 Vented Protected Filled Repeater Case	8
	RF809B3-050	407108661	12 Slot - 809B3 Vented Protected Filled Repeater Case	8
	RF809B3-060	406265058	12 Slot - 809B3 Vented Protected Filled Repeater Case	8
<b>25 Slot - 819 Manhole and Above Ground Repeater Cases</b>				
819A1	RF819A1-030	103064085	25 Slot - 819A1 T1 Protected Rptr Case, 81A1-1H/89A1	16
819B1	RF819B1-030	103062568	25 Slot - 819B1 T1 Protected Filled Type Repeater Case, 81B1-1H/89B1	16
819A2	RF819A2-030	103809844	25 Slot - 819A2 T1 Protected Hardened, Repeater Case, 81A1-1H/89A2	16
819B2	RF819B2-030	103809851	25 Slot - 819B2 T1 Protected Filled Type Hardened, Repeater Case, 81B1-1H/89B2	16
<b>820 Manhole, Pedestal and Pole Mount Repeater Cases</b>				
820A1	RF820A1-030-6-8	--	8 Slot – HDSL Protected Repeater Case	8
820A1	RF820A1-030-6-6	--	6 Slot – HDSL Protected Repeater Case	6
820A1	RF820A1-030-0-4	--	4 Slot – HDSL Protected Repeater Case	4
820A3	RF820A3-030-0-4	--	4 Slot – HDSL Protected Repeater Case Pedestal Mount	4
820A1	RF820A1-030-0-2	--	2 Slot – HDSL Protected Repeater Case	2
820B1	RF820B1-030-6-8	--	8 Slot – HDSL Protected Filled Repeater Case	8
820B1	RF820B1-030-6-6	--	6 Slot – HDSL Protected Filled Repeater Case	6
820B1	RF820B1-030-0-4	--	4 Slot – HDSL Protected Filled Repeater Case	4
820B3	RF820B3-030-0-4	--	4 Slot – HDSL Protected Repeater Case Pedestal Mount	4
820B1	RF820B1-030-0-2	--	2 Slot – HDSL Protected Filled Repeater Case	2

### 11.2 SPC – Special Product Company Housings

**Table 11-2**  
**SPC – Special Product Company**

SPC Universal Housings # of Slots	SPC Part Number	(P) Pressur-ized (V) Vented	External Ambient Temperature	GoDigital Approved STRM Capacity
6 Slot	7XXX-0656P-TB2, w/ 8" x 10" Standard Cover	P	122°F/50°C	6
6 Slot	7XXX-0656P-TA, w/ 8" x 10" Standard Cover	V	122°F/50°C	6
8 Slot	7XXX-0856X-XX, w/ 8" x 10" Standard Cover	P	122°F/50°C	6
8 Slot	7XXX-V856P-TQB2, w/ 11" x 10" Standard Cover.	P	122°F/50°C	6
8 Slot	7XXX-V856P-TQA, w/ 11" x 10" Standard Cover	V	122°F/50°C	6
8 Slot	7XXXD-V856P-TQB2, w/ 11" x 13" Deep Cover	P	122°F/50°C	6
8 Slot	7XXXD-V856P-TQA, w/ 11" x 13" Deep Cover	V	122°F/50°C	6
8 Slot	7XXXD-V856P-TQB2, w/ Therm-0°-Nator Cover	P	122°F/50°C	8
8 Slot	7XXXD-V856P-TQA w/ Therm-0°-Nator Cover	V	122°F/50°C	8

### 11.3 ADTRAN, Inc. Housings

**Table 11-3**  
**ADTRAN, Inc.**

ADTRAN Universal Housings # of Slots	ADTRAN Model Number	ADTRAN Part Number	ADTRAN Features & Description	GoDigital Approved STRM Capacity
4 Slot	LRH II-30AD	1150027L1	40 foot stub w/ air-core cable; local or remote pressurization.	4
4 Slot	LRH II-30FD	1150027L2	40 foot stub w/ gel-filled cable; local pressurization.	4
8 Slot	LRH II-30AS	1150058L1	Dual-cable stubs; 40 foot minimum w/ air-core cable; local or remote pressurization.	6
8 Slot	LRH II-30FS	1150058L2	Dual-cable stubs; 40 foot minimum w/ gel-filled cable; local pressurization.	6

## 12. Installed Environments and Applications

GoDigital does not make, sell or warrant repeater housings. The STRM modules are plug-in cards that fit standard 239-type plug in repeater slots in housings offered by others. GoDigital does not sell 239 housings themselves.

**12.1** Individual types of housings are specified for indoor, vault, pole, or manhole mounting. The viability of various installation types should be in accordance with housing manufactures guidelines.

**CAUTION: Housing installation must be in accordance with manufacturer's published procedures and limitations, or damage to the housing and to STRM module units can result.**

# Installation Note

## Straight Through Repeater Module (STR MOD)

---



**This page intentionally blank**

### **CONTACTING GODIGITAL**

**GoDigital Networks Corporation  
41652 Boscell Road  
Fremont, CA 94538**

**1-800-297-2424  
1-510-979-2200  
Fax 510-226-8785**

#### **Email**

**GoDigital Sales: [sales@godigital.com](mailto:sales@godigital.com)  
Technical Assistance: [product.support@godigital.com](mailto:product.support@godigital.com)**