SiteManager Serial agent setup and trouble-shooting guide

This guide describes the principles of configuring an agent for a Serial device connected to the Serial port on the SiteManager. Additionally this guide describes the principles of trouble-shooting the connection for Serial equipment for which there are no specific agent in the vendor agent list.

This Application note may be subject for more usage descriptions and solution scenarios in the future.

Version: 1.0, March 2013

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Introduction

The Serial port of the SiteManager is identical to the standard RS232 COM port of a PC. That means the cable that you would use for connecting a Serial device to the DB9 COM port of the PC can be used for connecting a SiteManager to the device also. This also apply for converters such as a RS232-to-MPI converter used for connecting to a Siemens S7 300 PLC.

The COM port of the SiteManager can be used for the following purposes:

- Connecting a PC software to a Serial device attached to the SiteManager, via the LinkManager virtual COM port and via a Serial agent configured on the SiteManager..

- Connecting an application using Telnet via a Device Relay, or an EasyTunnel connection to a Serial device. The SiteManager will transform the data on the Telnet port 23 to Serial data (refer to separate guides on how to configure Relay chains and EasyTunnel)

- Connecting a device to the SiteManager that uses the Serial port as SMS gateway using AT modem commands. This feature is available for SiteManagers with integrated modem only (model xx39)

- Resetting the SiteManager to factory default. This is the only way of resetting the SiteManager if the local admin password is lost and the SiteManager Web GUI cannot be reached from a GateManager. (refer to the separate guide for resetting a SiteManager to factory default)

This guide will focus on configuring an agent on the SiteManager. There are three methods for configuring an agent:

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1.   Selecting the proper Serial agent type

- Preferably select a vendor specific agent (such as **Allen-Bradley / Serial** or **Siemens / MPI**). The Serial settings will automatically be adjusted for the specific equipment.

- If your device is not listed as a vendor specific agent, you should use the **Generic / Serial** agent. This agent will attempt to detect and negotiate Serial settings with the device based on RFC2217. This agent will work in most cases.

- If your Serial device uses a more exotic Serial protocol, you may have to customize the settings. In this case, you should use the **Custom / Serial** agent. With this agent you can customize handshake patterns, bidirectional communication etc. Note that such customization is not trivial, and will typically involve support from technical specialists at Secomea.

2.   Problem Scenarios

The typical issues with remote Serial communication would be in one of the following categories:

- **The communication does not start at all.** This scenario will typically require either some documentation on the Serial protocol or traces from a working connection between a PC and the locally attached device. In worst case code changes are required, which will then result in implementation of a new vendor specific Serial agent.

- **The communication is interrupted or hangs.** This scenario is often result of the software requiring the acknowledge of the data faster than the remote connection can accommodate. See next section for trouble shooting and resolution proposals.

- **The communication is slow.** This could be due to the remote connection generally being slow, or that the software sends very small data frames, and requires acknowledge for each frame. Typically there is nothing to do about that. A theoretic solution would be to let the SiteManager simulate the acknowledge, but this would require code changes and an in-depth knowledge or analysis of the specific protocol.

3.   Trouble-shooting interrupted data or hang-ups

The following applies to adjusting the **Generic / Serial** agent. Remember always to restart the agent and reconnect with LinkManager when changes are made to Serial settings.

As mentioned the issues with data interruption or hang-ups are due to the software expecting a faster or smoother transfer. For instance it could be that the program expects the acknowledge faster than the communication line can accommodate. In this case you should check if you can adjust timeout settings in your software. It could also be that the speed is negotiated during the transfer, which could result in instability or hang-ups.

Adjustments of Serial settings are done in the **Parameters Details** for the agent, where you also find a link to the Serial **Monitor** that shows the current Serial settings (typically auto negotiated) and the actual data.

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3.1. Frame Size adjustment.

Check the Serial Monitor for a special pattern. It could be that there is a dominance of e.g. 6byte "packages". In this case you could try to set the Frame size to 6, or alternatively try with a full buffer size of 254.

Example of a communication displayed in the Monitor with 6 byte packages:

```
Line Monitor: [CONN] \rx\ /tx/ +mSec

[CONN(telnet): Aug 14 20:54:24 - 127.0.0.1]
+8830
/02
\10
/01/0d/02/10/03/1d
\10\02
+170
/10
\01\0d\20\56\30\30\2e\38\33\10\03\4c
+200
\02
/10/7e/fc/9b/cd/7e
\01\0d\20\56\30\30\2e\38\33\10\03\4c
+190
\02
+200
\02
```

3.2. Frame Timeout adjustment.

The default Frame timeout is 10 msec. This is displayed on the Monitor page as +10ms. You could try to increase that. Try first with e.g. 20ms, and increase to 100ms and observe the result.

3.3. Analyze Speed negotiation and fix the speed

The **Generic / Serial** agent uses auto speed negotiation based on RFC 2217. On the PC where the LinkManager is installed there is a log of the communication via the virtual COM port driver, where you can see the negotiated speed. The file **comlog.txt** is automatically created first time Serial communication has occured on the LinkManager and the file is found in the installed programs folder (e.g. C:\Program Files\Secomea\LinkManager)

Example from the comlog.txt file:

```
13:14:40.578   RECV: SB 44
13:14:40.578   101 0 0 4 176 SE
13:14:40.578   Remote baud rate: 1200
…
13:15:37.437   RECV: SB 44
13:15:37.437   101 0 1 194 0 SE
13:15:37.437   Remote baud rate: 115200
```

To fix the speed to e.g. 19200, you should enter the Parameter Details for the Generic / Serial agent and enter **!19200** in the Baud Rate field. Note that the speed must be prefixed with an exclamation mark in order to prevent unintended renegotiation during transmission.

Hint: In the Serial monitor on the SiteManager it can be determined if the port is in "auto-speed" mode. Connect with LinkManager to the agent, and if the Monitor shows 1200 7N1, it indicates that the port is ready to negotiate speed:

```
Device: /dev/ttyS0 (cur)  - 1200 7N1 -flow -modem min=1 tmo=0
Device: /dev/ttyS0 (mgmt) - 19200 8N1 xon/xoff -modem min=1 tmo=0
```

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```
Port DTE signals: DTR>off DSR<on DCD<on RTS>off CTS<off
TCP port: telnet(in)/rfc2217=127.0.0.1,23
Status:   In use by HKK-ESX-LMUser @ HKK-ESX-LMUser [rdm-hkk]
Connects: 1
Rx bytes: 0
Tx bytes: 0

Line Monitor: [CONN] \rx\ /tx/ +mSec

[CONN(telnet): Mar 21 09:55:12 - 127.0.0.1]
```

When connected to the agent via LinkManager, you could try starting e.g. Windows HyperTerm and connect to the virtual COM port used by LinkManager, you will then see the actual port negotiated in the Monitor. In this case 19200 8N1:

```
Device: /dev/ttyS0 (cur)  - 19200 8N1 -flow -modem min=1 tmo=0
Device: /dev/ttyS0 (mgmt) - 19200 8N1 xon/xoff -modem min=1 tmo=0
Port DTE signals: DTR>on DSR<on DCD<on RTS>on CTS<on
TCP port: telnet(in)/rfc2217=127.0.0.1,23
Status:   In use by HKK-ESX-LMUser @ HKK-ESX-LMUser [rdm-hkk]
Connects: 1
Rx bytes: 6
Tx bytes: 2

Line Monitor: [CONN] \rx\ /tx/ +mSec

[CONN(telnet): Mar 21 09:55:12 - 127.0.0.1]
+146600
/0d
+22060
/0d
\0d\0a\2f\20\23\20

/end
```

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