

Send SMS TLM

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1 About

1.1 Overview

1.1.1 Introduction

The SMS TLM is an add-on firmware option for SoftPLC version 4.x and later which can be purchased for each system needing the capability to send text messages. This capability is implemented as a TOPDOC Loadable Module (**TLM**), written in C++ and implements several ladder instructions (TLIs) which can be used for sending and receiving text messages via a GSM modem attached to the SoftPLC. This document describes the installation, usage, and functionality of the SMS TLM.

This TLM may be used to send or receive text messages by way of a ladder logic instruction, giving the user full programmatic control over the trigger conditions. Queuing is implemented, allowing a number of outbound messages to be triggered within a very small window of time. The TLM will queue up the requests on a first in, first out basis in the same way that an alarm annunciator would.

1.1.2 Concepts

The **SoftPLC runtime engine** software supports TLMs, which are shared library extensions to SoftPLC. A TLM may be loaded either as a **DRIVER** or as a **MODULE**. The difference between a DRIVER and a MODULE is that a DRIVER is called once per SoftPLC scan, and optionally an additional number of times per scan. A MODULE is only called when the control program decides to call it and not as an inherent part of the scan. TLMs are made known to SoftPLC in the MODULES.LST file which may be edited by TOPDOC NexGen by traversing to: PLC | Modules.

This SMS TLM is to be used as a MODULE, not as a DRIVER, and it provides TLIs that you call from your ladder program. A new request is sent on any false to true rung condition edge. The SENDSMS TLI takes a CONTROL datatable element as its first parameter and uses this to keep track of edge triggering and sending progress. Each TLI used in your ladder program must have its own dedicated unique CONTROL element.

1.1.3 Features

The SMS TLM requires that you have a GSM Modem and a SIM card configured for use with the wireless carrier from which a data plan has been purchased.

Note:

Contact SoftPLC for information and recommendations on acquiring and setting up a data plan for use with the SMS TLM.

Up to 20 requests may be queued at one time before the SMS-related TLIs will report that the queue is full. As soon as the first request has been processed, this frees up another slot and the TLI is then ready for another rising edge trigger condition.

Note:

Sending SMS messages over GSM modems is rate limited by wireless carriers to approximately 6-10 messages per minute. This limitation should be accounted for when designing your ladder program.

The SENDSMS TLI supports sending a block of data from an integer (N) file in the SoftPLC's datatable to a destination phone number. A block of up to 70 elements can be sent per message.

The RCVSMS TLI supports receiving a raw-data SMS message and writes the data to an integer (N) file block in the SoftPLC datatable.

The RCVTEXTSMS TLI supports receiving a plain-text SMS message and writes the received text into a string (ST) element in the SoftPLC datatable. If the text content of the received message is longer than the max STRING length supported by SoftPLC, it will be truncated.

Note:

Neither of the receiver TLIs supports handling of concatenated SMS messages.

1.1.4 Requirements

- A GSM Modem (SoftPLC Cat. No. [ICOMDM-GSMA](#)) attached to your SMART SoftPLC.
- A SMS and/or data plan and SIM card for the modem. SoftPLC can provide these at an attractive price - contact sales for more information.
- Version 4.x SoftPLC or later.

1.2 Terms of Use

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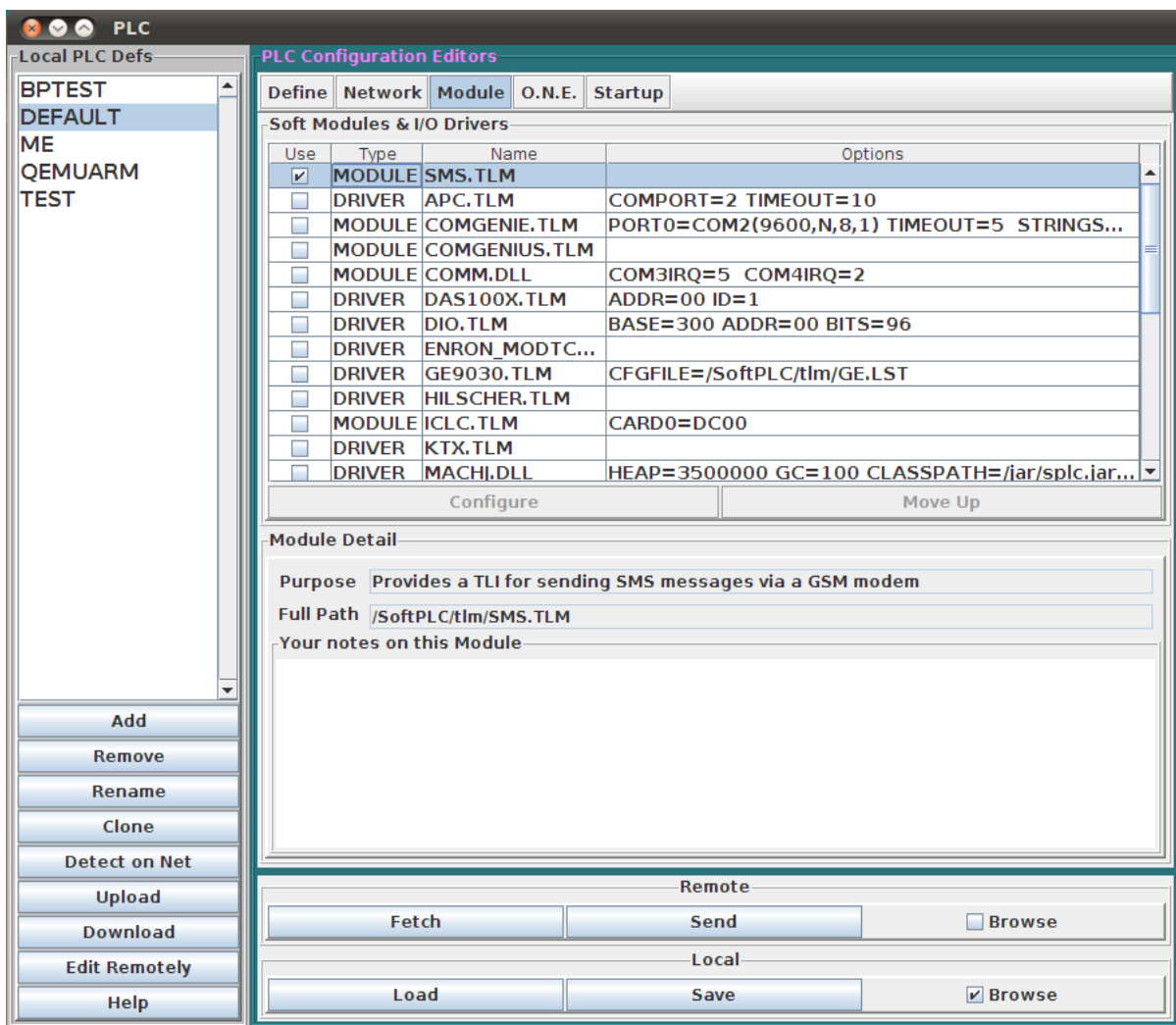
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2 Installation and Usage

2.1 Installation

2.1.1 Installation

The TLM is named sms.tlm.so, which you will need to install onto the SoftPLC from a packaged form using the **opkg** tool or directly copy the file onto the SoftPLC flash in the / SoftPLC/tlm directory. Then, enable it for use through NexGen's PLC | MODULES editor by selecting *Use* for SMS.TLM.



2.2 Usage

2.2.1 Ladder Instructions

2.2.1.1 TLI: SENDSMS

The SENDSMS instruction is used to send a SMS message containing a block of data. It is an edge triggered instruction and will queue a message to be sent each time the rung goes from false to true.

There are four (4) parameters for this TLI:

| Parameter Name | Description |
|-------------------|--|
| "Control:" | Control element (R) address. The ".LEN" word is used to indicate to the TLI how many words to send. The ".CTL" word bits are used to indicate activity status for the TLI. When the instruction is triggered, the enable (EN) and queue (EU) bits are set. On completion of sending, either the done (DN) or error (ER) bit will be set: the DN for a successful send, the ER for any error. The ER bit will also be set if the message queue is currently full. In addition to the ER bit being set in the ".CTL" word, the ".POS" word is used to store an integer value that maps to the type of error that occurred. |
| "Phone #:" | String element (ST) address. This is a string in the data table that contains the destination number which will receive the SMS messages. |
| "Data:" | Integer (N) block address. This is a block address (e.g. #N7:0) which will be used to stuff the message with data. The data sent will be a continuous section from the start element specified in this parameter and will include CONTROL.LEN elements. |
| "Result:" | String element (ST) address, which returns a text string indicating success or failure status of the SENDSMS operation. This is a text representation of the value in the ".POS" word of the control parameter. |

Table 1: SENDSMS TLI Parameters

2.2.1.2 TLI: SENDTEXTSMS

The SENDTEXTSMS instruction is used to send a SMS plain text message, containing the value from a single String element in the SoftPLC data table. It is an edge triggered instruction and will queue a message to be sent each time the rung goes from false to true. There are four (4) parameters for this TLI:

| Parameter Name | Description |
|-------------------|--|
| "Control:" | Control element (R) address. The ".LEN" word is NOT used for this TLI - it sends a single String element (up to 80 characters in length). The ".CTL" word bits are used to indicate activity status for the TLI. When the instruction is triggered, the enable (EN) and queue (EU) bits are set. On completion of sending, either the done (DN) or error (ER) bit will be set: the DN for a successful send, the ER for any error. The ER bit will also be set if the message queue is currently full. In addition to the ER bit being set in the ".CTL" word, the ".POS" word is used to store an integer value that maps to the type of error that occurred. |
| "Phone #:" | String element (ST) address. This is a string in the data table that contains the destination number which will receive the SMS messages. |
| "Data:" | String element (ST) address. This is a string in the data table that contains the text to be sent in the SMS message. |
| "Result:" | String element (ST) address, which returns a text string indicating success or failure status of the SENDTEXTSMS operation. This is a text representation of the value in the ".POS" word of the control parameter. |

Table 1: SENDTEXTSMS TLI Parameters

2.2.1.3 TLI: RCVSMS

The RCVSMS instruction is used to receive a SMS message containing a block of data. It is an edge triggered instruction and will queue a receive attempt each time the rung goes from false to true.

There are three (3) parameters for this TLI:

| Parameter Name | Description |
|-------------------|---|
| "Control:" | Control element (R) address. The ".LEN" word is used to indicate how many words of data were received. The ".CTL" word bits are used to indicate activity status for the TLI. When the instruction is triggered, the enable (EN) and queue (EU) bits are set. On completion of the request, either the done (DN) or error (ER) bit will be set: the DN for a successful receive, the ER for any error - including no messages to be received. The ER bit will also be set if the request queue is currently full. In addition to the ER bit being set in the ".CTL" word, the ".POS" word is used to store an integer value that maps to the type of error that occurred. |
| "Data:" | Integer (N) block address. This is a block address (e.g. #N7:0) which will be written to with the message data. The data received will be written in a continuous section from the start element specified in this parameter. The number of elements received will be noted in the CONTROL.LEN word. |
| "Result:" | String element (ST) address, which returns a text string indicating success or failure status of the SENDSMS operation. This is a text representation of the value in the ".POS" word of the control parameter. |

Table 1: RCVSMS TLI Parameters

2.2.1.4 TLI: RCVTEXTSMS

The RCVTEXTSMS instruction is used to receive a SMS plain text message. It is an edge triggered instruction and will queue a receive attempt each time the rung goes from false to true.

While it is possible to send up to 160 (ASCII) characters with a normal SMS text message, SoftPLC STRING elements only support 80 characters. Any text received beyond the 80-character max will be truncated (discarded).

There are three (3) parameters for this TLI:

| Parameter Name | Description |
|-------------------|--|
| "Control:" | Control element (R) address. The ".LEN" word is used to indicate how many characters of text were received. The ".CTL" word bits are used to indicate activity status for the TLI. When the instruction is |

| Parameter Name | Description |
|------------------|---|
| | triggered, the enable (EN) and queue (EU) bits are set. On completion of the request, either the done (DN) or error (ER) bit will be set: the DN for a successful receive, the ER for any error - including no messages to be received. The ER bit will also be set if the request queue is currently full. In addition to the ER bit being set in the ".CTL" word, the ".POS" word is used to store an integer value that maps to the type of error that occurred. |
| "Data:" | String (ST) element address. This is a string in the datatable which will store the recieved text of the SMS message. |
| "Result:" | String element (ST) address, which returns a text string indicating success or failure status of the SENDSMS operation. This is a text representation of the value in the ".POS" word of the control parameter. |

Table 1: RCVTEXTSMS TLI Parameters

3 All