Kinematic Measurement Systems
Summer Semester 2019

Lab 1 *(Team Laboratory)*
Group:___
Steering of Robot-Tachymeter

Date of first submission:

Date of renewed submission:

Date of issue	23.04.2019
Submission	07.05.2019

Number	First name	Last name	Student ID	Signature
1				
2				

Testat	1. control	Resubmission until	2. Control

1   Task

Kinematic measurements may be realized using robot tachymeters. For steering of robot tachymeters flexible programs are often needed. One important issue is the communication between the PC and the tachymeter. For this reason standard protocols are used. In this lab the Leica GeoCom protocol should be used to establish the communication. The code is based on the ASCII protocol.

Following functions should be implemented in the programming language LabView:

- Initialising
- Steering of tachymeter
  - Compensator on/ off
  - Change face
  - New measurement
  - Readout of Hz-, V- angle and slope distance
- Storage into file

2   Elaboration

- The labsheet must be submitted as hard copy.
- <u>Each student</u> has to write a small report (in his own words) with description of the performed steps.
- A flow chart diagram of the written program must be attached to the elaboration.
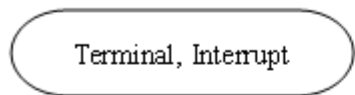- <u>One program per group</u> has to be submitted (upload to ILIAS).

3   Remarks

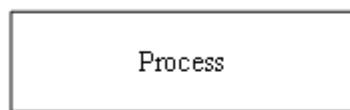All angles transmitted to and from tachymeter are in radiant.

4   Attachements

- Signs and symbols of flowchart diagram
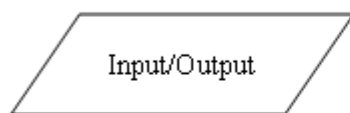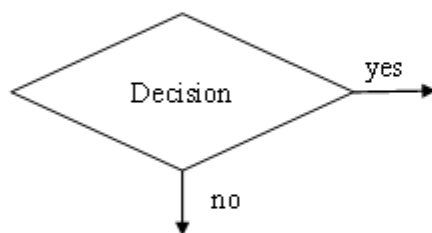- List with selected commands for GeoCom interface

Signs and symbols

Terminal, Interrupt — A terminal point – start, stop, halt, delay or interrupt
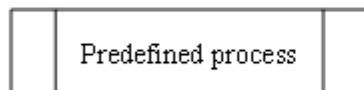
Process — Any processing function; defined operations or location of information
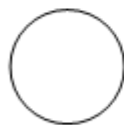
Input/Output — General i/o function; information available for processing (input), or recording of processed information (output)
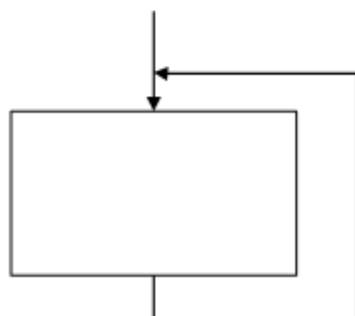
Decision — A decision or switching-type operation
yes / no

Predefined process — Subroutine, function

(Connector) — Connector: Exit to, or entry from, another part of the chart

(loop) — loop

Commands (GeoCom)
for Leica TPS 1200- Series (e.g. TCP1201, TS30)

Command	Response	Meaning
%R1Q,9028:	%R1P,0,0:0 (Status: ok)	Change Face
%R1Q,9037:dHz,dV,0	%R1P,0,0:0 (Status: ok)	ATR Fine pointing (dHz,dV are definitions for the searching window in radiant)
%R1Q,2008:1	%R1P,0,0:0 (Status: ok)	New measurement

%R1Q,2108:1	%R1P,0,0:1284,5.7175979871,1.561920067,1.81901
	
	 corresponds: Hz: 363.9936 gon
	                  V: 99.4349 gon
	                  S 1.81901 m
	
	 („%R1P,0,0:1284" : Warning, Accuracy not ensured;
	 „%R1p,0,0;0" : Status: ok)
		Get data
		 Hz-angle [rad]
		 V-angle [rad]
		 Slope distance [m]

%R1Q,9027:*HZ,V* *Hz, V in [rad]*	%R1P,0,0:0 (Status: ok)	targeting absolute angles
%R1Q,6007:*dHZ,dV* *dHz, dV in [rad]*	%R1P,0,0:0 (Status: ok)	targeting relative angles
%R1Q,5004:	%R1P,0,0:0,Name (Status: ok)	Type of instrument
%R1Q,2006:1	%R1P,0,0:0 (Status: ok)	Compensator on